The Strategy of Great Railroads

Frank H. Spearman

THE STRATEGY OF GREAT RAILROADS

BOOKS BY FRANK H. SPEARMAN

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THE STRATEGY OF GREAT RAILROADS

BY

FRANK H. SPEARMAN

WITH MAPS

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TO

WILLIAM C. BROWN

VICE-PRESIDENT OF THE NEW YORK CENTRAL

AND THE LAKE SHORE RAILROADS

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THE VANDERBILT LINES

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On the lower river front of a little New Jersey town, flanked on the one hand by dreaming hulks of rheumatic towboats, and on the other by the decaying buildings of a past generation, stands a forsaken hotel. Its windows, framed once to cheer, stare wide and sightless upon the street, and its heavy oak doors swing crazily to every wind; its floors creak uneasily under strange feet and its broken halls echo vacantly to living voices. Only bats and spiders and wood-worms seek its hospitality now; yet to the American railroad world this ruin ought to be of singular interest.

The name of the place was once the Steamboat Hotel—the genius of its owner breaking out even then in the title he chose for his inn. But the venture was never, at its best, all that its founder hoped. What now lends strange interest to the shabby landmark is, that out of the magic of its early days have risen stately palaces, lofty façades, a dynasty of American railway magnates, the splendor of Oriental dreams, and a system of transportation unapproached in the story of the

world; for under the roof of this New Brunswick ruin Mrs. Vanderbilt, it is said, saved the first eight hundred dollars that gave her husband, the Commodore, his start in the transportation business.

To-day the Vanderbilts are the merchant princes of the railway world. Yesterday, on their own lines, they handled 70,000 cars; to-morrow it may be 100,000. When the founder of the system began in those early days to wrestle with problems of transportation, when he was getting his first taste of competition and rate wars and was carrying passengers by boat from New Brunswick to New York for sixpence, with their dinners (perhaps literally) thrown in—the straight tariff being two shillings—Spain still retained a vast American empire; but the Vanderbilt dynasty, growing ever more powerful, has seen the last vestige of Spanish sovereignty wiped from the maps of two continents. When the founder of the Vanderbilt fortunes lay in swaddling clothes the house of Baring Bros. & Co. stood at the height of its power, and its founder, Sir Francis Baring, was writing his "Observations on the Founding of the Bank of England." When this young Cornelius Vanderbilt, the future Commodore, had reached the obscurity of his twenty-first year, Nathan Rothschild, already powerful, was spurring upon London with the secret of the French defeat at Waterloo;

but the Vanderbilts have lived to see the name of Baring forgotten and the fame even of the Rothschilds equalled by their own.

Busied with its transportation concerns, the house saw the earliest alignment of those political movements in the United States that resulted in the most stupendous civil conflict of modern times. They stuck to their ferryboats and their junk rails when Beecher was the pulpit and Greeley and Bennett and Raymond were the press of this country. While still active in their business they have seen the rise of every existing political party, and they may easily survive the obsequies of the last of them as they stand to-day. In the stage-coach and the canal mule they met and overcame the threatening competition of fifty years ago; and their forces would face to-morrow with equal steadiness a billion-dollar invasion of their railroad territory. They alone, in all the railroad world of to-day, go back, owners and managers in unbroken succession, of the telephone, the cable, and the telegraph. Nor in all that time have they ever wrecked a railroad or maintained a poor one.

The Vanderbilts are not, of choice, fighters; they have been conservative and well-balanced merchants. No other family can lay claim to titles such as theirs to great and honorable achieve-

ment as masters of transportation. To meet objection let it at once be conceded that the meaning we attach to these adjectives is relative. But if we consider a moment, what other combination in industrial enterprise can boast a more colossal and creditable monument than the New York Central lines?

Aside from their remarkable history, Vanderbilt affairs are of present moment in American railroad control because they are so powerful both in the extent of their holdings and the character of them. A map of the New York Central lines is startling. At first glance the spread of their ramifications would seem to cover the United States. There are in the various systems under this control 12,000 miles of railroad; but these figures do not tell all. It must be remembered that a Vanderbilt line is always a good line. If they buy a streak of rust—and first and last they have bought many—they make a good railroad of it. The outcast youngster is fumigated, scrubbed, and properly clothed before he is allowed to take his place at the foot of the Vanderbilt table, with the aristocratic New York Central and the emotionless Lake Shore. The acquiring of the Nickel Plate years ago, and that of the Lake Erie and Western very recently, are cases in point. Moreover, how shall the mere mileage of

any system reckon in comparison with New York City terminals that are in themselves equal in value to whole divisions of roads spread over desert stretches? It is asserted by an alert passenger department, and no doubt with truth, that more than one-half the people of the United States live in the territory covered by the Vanderbilt lines; certainly the people within their territory are the active half of the country. Vanderbilt steamboats plough the great lakes from end to end with the speed and with the capacity of freight trains many times enlarged; and their rails, ignoring political boundaries, are factors in the transportation systems of Canada. Vanderbilt lines are powerful in New England, and they make their rates over their own roads at Toronto, at London, and at Montreal. Their cars and their boats may be found side by side at the Straits of Mackinac, and their roads stretch thence in unbroken joints to the Mississippi, at St. Louis in Missouri and at Cairo in Illinois. They intercept the Illinois River at Peoria; they tap the Ohio River at its starting point with a road that earns $68,000 a mile, and strike it again and again—now at Wheeling, at Cincinnati, and at Louisville—and they abandon it only at its mouth.

If to this map the spheres of Vanderbilt influence are added we should be compelled to annex

the territory of the whole Northwest with the Chicago and Northwestern system and its branches of 8,000 miles spreading as far west as Wyoming, penetrating the Black Hills, and pushing docks from Marquette to Duluth into Lake Superior. Happily, however, and contrary to popular impression, the Northwestern is not a Vanderbilt line, their interests in it being only those of a moderate minority. Nevertheless, at our greatest inland railroad gateway, Chicago, three of the most powerful lines of the Vanderbilt system receive the traffic of the Northwest from every road of importance and exchange for it their commodities from the dense territory on the Atlantic seaboard. And notwithstanding the immense tonnage delivered to the New York Central lines by their Western and Northwestern connections, the great system gives, in turn, to each of them a tonnage materially greater in amount than it receives —demonstrating eloquently the resources of the territory that it serves.

Paradoxical as it may be, it is true that the Vanderbilt lines east of the Chicago gateway are too strong to own, or at least to grant exclusive favors to, any one line into the West or Northwest. The great transportation capacity of the Michigan Central, the Lake Shore, and the Big Four means that they must receive from, as well as give to,

connecting lines a huge volume of freight. The traffic the Vanderbilt lines exchange with the St. Paul road, for example, is far too large to be disturbed by any exclusive interchange at Chicago, and it is this particular feature of traffic interchange that bobs up at every step in railroad consolidation to disturb the dreams of railroad kings. The Alton, for instance, may be considered the natural link in the Harriman lines to Chicago, but when can the Union Pacific afford to ignore what the Northwestern road has to offer, if treated fairly? Mr. Hill is a director of the Erie road, but he could hardly venture to stop Burlington interchange of traffic with the Lake Shore and the Michigan Central.

The truth is, that which people continually see in the railroad sky is consolidation, and there are periodical outbursts of alarm at the menace of railroad monoply. What people do not realize is that the country all the while is growing faster than the railroads; that it is constantly ahead of all successful transportation combinations, and that railroad consolidation is only a reflection of the country's development in every other direction.

The New York Central lines, because they are made up of some of the oldest railroads in the country, afford many interesting data on the question of consolidation, since first and last they are

all consolidations. Their beginning goes back to the New York Central Railroad, seventeen miles long, in 1831; but the most advanced anti-monopoly champion of 1904 could hardly stand for separate lines of railroad in Kansas, much less in New York State, seventeen miles long. The development of the richest country in the world—that covered by the Vanderbilt rails—has always forced the investments of the house ahead even of its ambitions. The problem of the New York Central lines has never been so much to secure business by taking it from competitors as to provide for the volume that has naturally fallen to their share. Thus the study ever foremost in the system, growing so fast and so unwieldly, has been the railroad problem of operating — the handling of the traffic.

The proper fitting to its place of each extension and each newly acquired line in a railroad system such as this is in itself a brain-racking matter. A concourse of the railroad presidents of such a combination becomes a domestic congress acting as a committee of the whole, in which measures for the well-being of each branch of the system are considered and on which the resources of the keenest railroad intellects are brought to meet the exigencies of each case.

In the country where railroad operating has

been brought to so high a degree of excellence as in this it is impossible to award the credit for its development to any one railroad system. Each has its particular achievements, and in operation one or two have particularly high reputations. Of the Vanderbilt interests, however, it must be said that either they have been exceptionally lucky or exceptionally wise in attracting to themselves a type of executive men who are always bigger than anything laid down in railroad books. "System" is recognized pretty generally to-day as a requisite in the successful conduct of any business; but successful men, better than others, understand the grave danger that lies in system. No railroad can afford to let any system of operation ossify on it. In reality, system in any business is but a necessary evil, and the best system is tearing down all the time as well as building up.

Herein the New York Central lines show to an unusual degree their power in the transportation world. That adherence to rules which under small men paralyzes a railroad's activities becomes under the Vanderbilt staffs a code elastic enough to cover an emergency rather than rigid enough to cause one. The heart of the Vanderbilt lines is the New York Central; but in its operation it is never for a moment forgotten that "system" was made for the New York Central and not the New York

Central for system. The New York Central lines breathe through the Lake Shore road; but the Lake Shore code of operation is most surprising in its flexibility and its easy adaptation to the one supreme end of getting results. That which may have seemed good railroading on the Lake Shore when these words are written may seem poor railroading by the time they are printed. Every day almost the viewpoint changes to meet new conditions, and every day from the outposts of the New York Central lines letters go to headquarters from trained observers—high executive officials—bearing a heading that is always the same:

THE SITUATION

We feel that we get news in the daily press; so we do. But as to the special news that bears continually on the interests of the New York Central lines, one should see these private daily journals. The men that write them are past-masters in the school of journalism and draw salaries beyond the dreams of editors. Every day their articles bear the one insistent title: THE SITUATION

As shifting as the sands of the Mississippi, uncertain as the freaks of fortune, and at times as startling as a political revolution is this daily business situation. The millions of people in the

grain-producing territory of the Missouri River country and the Mississippi Valley are, or ought to be, vitally interested in the question of Gulf transportation for their export grain, but they know nothing about the roads that supply their Gulf outlet; not so, however, the Vanderbilts. From month to month, week to week if need be, they know the exact physical condition of every road to the Gulf of Mexico—their own rivals in the transportation of grain to the seaboard. If a Gulf road is so poor in condition and equipment as to be harmless the fact is known at Forty-second Street in New York, and every step to better it is there carefully noted. The rise and fall, the growth and decay of every American industry, if it bears even collaterally on railroad interests, is marked by the New York Central lines. Grain, for instance, is their most important eastbound commodity, and Chicago is a great thoroughfare for the grain traffic. Grain is fifty per cent.—one-half—of the entire eastbound business of the Lake Shore road from Chicago; yet so incredible are the industrial activities of Indiana, Michigan, Ohio, and Pennsylvania that this enormous item is but nine per cent. of the total business of the Lake Shore.

However, 200,000,000 bushels of grain pass through the Chicago gateway in a single year.

In the development of this business Chicago elevators have become of huge importance. It is these enormous and picturesque piles, whose proportions mark the skylines of the Chicago sunset, that have been for years a compelling factor in grain transportation. They have stood during a generation as a monument of Chicago industrial enterprise, and but a few years ago the last of them were being built with the bribe of big bonuses to contractors for their rapid completion, and the struggle of men against the elements to make these huge receptacles ready within an imperative limit has been the subject of stirring romance. Within recent years a Chicago road in condemning for terminal purposes the site of a Chicago elevator was compelled in court to cover the ground with gold. To-day it is hardly too much to say that could the railroad have waited it might in time have acquired the site---so far as its value for elevator purposes is concerned—for the taxes. Chicago has an elevator storage capacity of 50,000,000 bushels of grain—the regular houses 37,000,000 bushels, and the grain "hospitals," where grain is dried and cleaned or mixed for grades, 13,000,000 bushels. Within recent years there have been as high as 30,000,000 bushels of grain in storage in Chicago. No more impressive example of the daily readjustment of traffic

conditions can be had than in the story of the downfall of the elevators in the economy of transportation. Two years ago these elevators held 12,000,000 bushels; last year their store had shrunk to 9,000,000 bushels; to-day it is 4,000,000 bushels. The fate of the elevator is a revelation of the pitiless movement of The Situation.

There is quite as much grain as ever, but prosperity has so intrenched the Western farmer that he is no longer compelled to sell on the day that he threshes out his crop. Moreover, the constant trend in railroad affairs is to transport commodities without rehandling. In grain this means an important economy to the shipper, inasmuch as storage, insurance, and delay are thereby done away with. The reading public may or may not be familiar with these constantly changing phases of the industrial world; but by the New York Central lines each of them is marked as impassively and as accurately as a doctor at a sick-bed notes a rising or a sinking pulse.

In another way the perfecting of the operating of modern railroad systems has made of Americans very notably a hand-to-mouth people. The last generation laid in its supplies in the fall for the winter; this generation buys from day to day. The country merchant bought then twice a year; he buys now twice a week. Why carry stock

when trains run so often and it has been made so easy to get goods? If within a hundred miles of his jobbers he hardly takes the time to write a letter; he telephones. The travelling man no longer makes a sixty-day trip. He sees his trade once a week or once in two weeks, and covers three or four towns in a day.

We become thus wholly dependent for the necessities of life on the masters of transportation, and because we lean on them more and more the slightest break in their facilities becomes each year a more serious matter. Again, such a break causes most unlooked-for changes in the whole situation of supply and demand. The anthracite coal strike caused distress to millions of people who depended for fuel on hard coal. But the railroads are like ants; taking no account of damage they set at once about repairing it. Soft-coal roads found in The Situation an opportunity to exploit their fuels, with the result that, a year later, boats laden with anthracite coal could not find room in Chicago to unload their cargoes—their docks being already piled high with hard coal for which there were no customers: the railroad had shown too easy an escape from anthracite annoyance and expense.

Prosperity gives the operating officer even severer tests. In the high-tide periods of business

every weak spot in the operating department makes itself felt. This is the moment in which reputations take wings, and it is in crises such as these that the Vanderbilt lines have not been found wanting.

Their operation suggests at once the precision of a military discipline. What is most striking is that in their code the stiffness of the martinet is wholly absent. The operating officer of such lines as the New York Central and the Lake Shore has his battalions in the motive power, the car equipment, and the division staffs that are under him, and he handles all with an absolute authority. The car and the train movements of his system lie every morning tabulated before him, and this man and his like become, in effect, the field marshals of our daily bread. He moves every day thirty, forty, fifty thousand cars of freight. He divines from his frequent reports the hard-pressed spots in the far-flung lines of his train movements, and with his reserves massed he strengthens his divisions wherever weak spots develop. Nor are these figures of speech in any degree fanciful; they are as hard, as practical as possible. It is no uncommon thing for midnight orders to empty roundhouses at Buffalo, Utica, or Syracuse and head a battery of New York Central engines westward to forestall a blockade at a

Lake Shore terminal. If the pressure is reversed Lake Shore motive power is thrown with equal celerity into the fight to strengthen car movement on the New York Central. The plan sounds simple, but within very recent years railroad systems of high repute in operating have been completely tied up because motive power to move trains was lacking on one division, or on one road of the system, while on another motive power was standing idle in the roundhouses.

Prosperity has for three years put a freight traffic strain on American railroads comparable to a steady World's Fair pressure in passenger movement. The weakest link in the operating chain of all our roads has become so apparent under the test that a competent operating officer has need to say to a railroad owner only this: Show me your terminal facilities and I will give you the earning power of your road. So precisely is this true that there have been times when the entire activities of the Vanderbilt system were restricted to the facilities of their intermediate terminals—when the effective power of so great a railroad as the Lake Shore has been very strictly limited by two freight yards, that at Elkhart, Indiana, and that at Collinwood, Ohio. Hence it is that, turning the attention of railroad operators from the lessening of grades and curves, the struggle

to-day is a constant endeavor to enlarge terminals, and a Vanderbilt requisition for a new freight yard frequently calls for a million dollars. Their lines show to-day, with those of the Pennsylvania road, the most interesting examples in the world of terminal improvement, the highest present strategy in railroad competition.

A slight consideration of these besetting "features" of the Eastern railroad situation—the pressure of traffic and operating problems on the various lines as they now stand—will make clear the apparent apathy, so far as new fields of control are concerned, of the most powerful interests in the American railway world. It is more than true that they all have their hands full to keep pace with the pressure of the situation as it is reflected in the bursting growth of the country. That they must meet its demands is evident, and to do this may well, as it does, engage all their abilities without listening to the promptings of a wider ambition.

THE PENNSYLVANIA SYSTEM

THE PENNSYLVANIA SYSTEM

Lay a hand over a map of the Pennsylvania lines, and the circulation of the blood through the one suggests the circulation of traffic through the other. When Garrett extended the Baltimore and Ohio westward he saw only St. Louis and Chicago, and ran nothing but trunk lines. The Pennsylvania System is so fed and strengthened, division by division, that each link is in itself almost a self-sustaining unit. On its intricate map each branch has a particular reason for being; each has been definitely thought out and added because it has a function. Capillaries are as essential to the circulation of the blood as arteries, and one great source of Pennsylvania Railroad prosperity lies in its capillaries.

The system covers the industrial heart of the continent. North of the Potomac and the Ohio its lines are strong at all traffic points from the Mississippi River to the Atlantic seaboard. But the Pennsylvania Railroad, in its essential strength, stands for the State of Pennsylvania, to which, as a State, an industrial pre-eminence has so long

been accorded that the country has become decently resigned to its marvels. Its anthracite coal alone would make it the richest of our possessions; its soft coals and cokes, its iron and gas, have made the Pittsburg district first in the world as a traffic centre.

Pittsburg itself is a Pennsylvania Road fortress. Its river benches are lined with steel plants and factories, and its river banks are revetted, tier upon tier, with Pennsylvania siding tracks. Pennsylvania trains are made up under the smoke of its rolling mills and converters, and Pennsylvania shifting engines ceaselessly patrol its industrial camps. There is but one Pittsburg; its locomotives are shipped to Siberia, its bridges span the rivers of Africa and of India, and the battles of Russia and Japan are fought behind its armor-plate.

Iron and steel thus become heavy factors in Pennsylvania Railroad freight. But even steel tonnage sinks into obscurity when put beside that of coal. East of Pittsburg, in 1903, the road moved seventy-seven million tons of coal and coke. The history of the Pennsylvania Road is in a way the history of the State. The story goes back to the crossing of the Alleghany Mountains by means of waterways and inclined planes. Then comes a Titan, an American engineer, John Edgar

Thomson, who runs the pioneer grades and spikes the iron rails clear across the summit of the Alleghanies. Thomson laid the foundations of the greatness that underlies the present Pennsylvania System; he made it possible to move, as this road does, one million tons of freight in a single day on one American railroad. The Pennsylvania men of to-day would laugh if compared to Thomson. "We are specialists," they say, "that is, pigmies. Thomson was great in everything—operating, traffic, motive power, finance; but most of all in organization."

Tradition under such circumstances becomes an influence, and the Pennsylvania System has an unbroken tradition of nearly sixty years of successful railroading. Stress is laid most of all on organization, a legacy rounded out and bequeathed from management to management. Nor has any railroad speculator ever succeeded in seating himself in the saddle of Pennsylvania affairs; for fifty-nine years the company's destinies have been controlled by its owners, the stockholders, and annually they have approved or disapproved its policies. In return, they have received what few American railway investors can boast—a satisfactory return on their shares for every calendar year since 1846. It can hardly occasion surprise, then, that the Pennsylvania Railroad should enjoy

high credit; it has earned an international reputation for good faith.

With a background of such united effort and a success so unusual it is not hard to understand why Pennsylvania standards and practice are held high among American railroads. In 1861 the Pennsylvania Road put the first steel fire-box under an American locomotive boiler. The Pennsylvania was the first of our roads to lay steel rails and the first, in 1863, to lay Bessemer rails in this country. It was the first to use the air-brake and the signal block system. The Number One shop still standing at Altoona was the first, in 1873, to use an overhead crane. In 1852 the Pennsylvania Road moved 70,000 tons of freight in a year; it now moves that much in an hour. It handled, then, half a million passengers in a year, now it cares for a hundred and twenty-three million. The system that once mustered fifty engines now counts 215,000 freight cars, and a single shop plant at Altoona turns out five new locomotives every week.

This is high-pressure railroading. Pennsylvania plans need to be laid on an unexampled scale, for the reason that nowhere do precedents exist for its requirements. Moreover, peculiar difficulties attend the operating of the great Pennsylvania main line across the higher Alleghanies, where, the traffic

being largely coal, the movement reaches a climax with the utmost regularity in November and March, remaining near the high mark during the winter months between. Thus the heavy movement comes against the elements when they are at their worst. If it could be shifted to July and August, when engines run at one hundred per cent. of their rating, no especial difficulty would be felt in mountain railroading; but when grades are to be climbed in winter storms, with engines running at fifty per cent. and sixty per cent. of their effectiveness, the problems become severe.

At the best, operating cost under such conditions stands at the high point, and a railroad needs the most ample track and yard room if the charge is not to become excessive. In consequence, a continual effort is made to enlarge Pennsylvania facilities. An Altoona roundhouse cares for 250 locomotives every day, and a companion house has been built to take care of 300. The Altoono plant has shopped and repaired as many as 148 engines in a single month.

The material triumphs of Pennsylvania management are thus very considerable; they do not, however, by any means engage all of its activities. Out of 1,200,000 railroad employees in this country, over 153,000 are on the pay rolls of the Pennsylvania System. Here is the heaviest moral

accountability put upon any existing railroad management. What of the employees?

When a man enters the Pennsylvania service he may at once protect himself with insurance benefits against sickness or accident, and the same agency which provides this health and accident insurance pays his family a full benefit for his death from any cause. The Pennsylvania employee thus has offered to him the advantages of several insurance companies in one. This Relief Department, too, considered purely as insurance, enjoys advantages that take it quite out of comparison with ordinary insurance; for instance, the company pays all costs of its operation. Again, the weak feature of all fraternal insurance is its instability. But the relief insurance provided to Pennsylvania employees is backed by the entire responsibility of the company, a mere statement of whose assets would pale the figures that are the joy of the New York actuary. Beyond this, the retired employee belonging to the Relief Department receives his superannuation allowance wholly distinct from, and in addition to, a pension, which is likewise provided for all retired employees.

The distinctive feature in this broadly conceived Pennsylvania Railroad Pension Fund is that the employee contributes nothing whatever to it except his years of faithful service to the railroad.

The company pays the pension, without a tax or contribution of any sort from its employees, and rejoices to-day in one pensioner on its roll of honor ninety years old. Boys and men are in this way made to feel when they enter the service of the company that they become a part of it; that if they will train themselves to co-operate with others they may participate fully and personally in the company's success; and that, after a career of faithful service, every man, from the president down to the laborer, will receive—not as a charity but as a gratuity—his life pension.

The provisions for the care of this immense army of workers do not end here. Many Pennsylvania employees are so situated in their duties that safe and convenient places for saving a portion of their wages are not within reach. The Pennsylvania Company thereupon turns every ticket agent on its lines into a depositary for employees' monthly savings, on which it pays to them three and a half per cent. interest. This Pennsylvania Employees' Savings Fund is likewise conducted without one dollar of expense, direct or indirect, to its fortunate depositors. It is not intended as a place for the investment of the funds of employees, but for their savings for investment. A man may not deposit more than $100 in any one month, nor keep above $5,000

on balance at any one time, and employees receiving above $300 a month have been excluded from using it. But, notwithstanding these restrictions, the aggregate deposits received since its founding in 1887 exceed ten millions of dollars, and since that time more than one million dollars of interest have been allowed to Pennsylvania Railroad workers by the Savings Fund trustees. Moreover, six millions of dollars have been withdrawn by employees for homes and investments.

So many safeguards mean a great deal of painstaking thought at headquarters, and it comes as a surprise to learn that, in return for duties most exacting, Pennsylvania Railroad directors receive under the company charter no compensation; but in the State of Pennsylvania no position is held in higher esteem than that of director of the Pennsylvania Railroad; it is a badge of honor to which no citizen is too distinguished to aspire. These directors represent, in the history of the road, a continuous line of able financiers, and are aided in their work by four additional directors, who serve as vice-presidents: S. M. Prevost, head of the traffic; Charles E. Pugh, head of operations; Captain Green, in charge of the general finances, and Samuel Rea, specially charged with the New York. tunnel extension; and they are men who command a peculiar loy-

alty from their subordinate heads. Indeed, the officers and executives of the Pennsylvania Railroad have been to a remarkable degree all-round men. From its roll of engineers alone may be named J. Edgar Thomson, Edward Miller, William B. Foster, George B. Roberts, A. J. Cassatt, Herman J. Lombaert, J. N. Du Barry, W. H. Brown, Strickland Kneass, and Samuel Rea. Vice-President McCrea, in charge of all company affairs west of Pittsburg, is also of this type of men—not alone engineer, but thoroughly trained railroad man. Thomas A. Scott and Frank Thomson, though not engineers, were everything else that American railroad men can be, and their chapters in the road's story and their services to the country in the Civil War are national chapters.

The continual problem before all of these men has been to keep pace with the transportation needs of the most highly developed and most active industrial portion of the United States. Pennsylvania management of necessity stands in high light in the worlds both of transportation and finance, and because silent under controversy and abuse it is often reproached with being careless of public opinion; yet silence under clamor does not needfully imply insensibility to criticism. The situation of the present management of the Pennsylvania is rather that of men under the pressure

of serious affairs, and endeavoring day by day to pass for the best on very difficult questions. In particular, Mr. Cassatt, as the executive front to-day of Pennsylvania interests, has been hotly assailed as a disturber of public tranquillity. There seems to have been a well-considered attempt to place him widely before the American imagination as a sensational type of railroad chauffeur driving a motor-car down the railroad highway at an insensate speed, reckless of the interests of investors, the opinion of the public, and the common rights of property. But to set him forth in this light has called for the most complete distortion of the man as he really is, and the mere sight of this Nestor of American railroad presidents wholly dispels such a conception.

A grave man and somewhat spare in his height, with the slight stoop of the careful thinker; easily quiet but perfectly responsive. In his presence no atmosphere of "drive," hasty action, or confused thought suggests itself. This is a very safe man, one reflects instinctively, deliberate in considering, slow of judgment, patient in decision, but capable—when action must come—of a tremendous initiative and follow-through. The source of such strength is apparent in the man's manner; Mr. Cassatt has the simplicity of Lincoln.

One could easily associate this executive chief of the Pennsylvania Road with a farm, but not so easily with an automobile. Met on a highway in Iowa, one would expect to find Mr. Cassatt superintending the planting of a six-thousand-acre field of his own corn. The impression under those circumstances would be that such a man would make a good governor of the State, and no surprise would be felt to learn on inquiry that he had been governor. Such a model farm owner, if asked about the adjustment of hoppers on the battery of corn-planting machines lining up then to cross the field, would explain with genuine interest that he had adjusted the planters himself after they left the factory so that the hopper should deposit in each hill precisely four kernels of corn, and not occasionally three or five. Or if you remarked on the sleekness of his hundred teams of mules, his appreciation of the comment would lead him to speak of the popular misconception concerning the mule as an evil-tempered laborer, and as being less trustworthy than the horse.

But Mr. Cassatt's cares and responsibilities do not lie among corn-planters nor along Iowa highways. They have followed him for some years as the head of one of the most important railroads in existence, and he stands with his associates in

this management as trustee of an investment so huge that figures lose their force in attempting to express its measure. The Pennsylvania System controls nearly one hundred and fifty corporations —mostly railroad companies—east of Pittsburg alone.

About the time Mr. Cassatt took the presidency very grave questions became apparent on the horizon of Pennsylvania Railroad affairs. It was evident that the day could be named when the traffic of that large portion of our industries dependent on the Pennsylvania System for transportation would swamp its existing facilities. The situation needed to be met by very extensive additions to track and terminal facilities, and plans were at once laid to provide them. But the day of congestion came; the day of a traffic flood so terrific as to burst in an hour from the control and restraint of the highest transportation facilities in the world.

Strangely enough, the very measures taken to meet these wholly new industrial conditions have been made the particular object of hostile comment. There is nothing whatever unnecessarily radical, nothing savoring in the least of the revolutionary in the present Pennsylvania betterments. The simple truth behind them is that for this country's industrial expansion so great an

artery of our transportation system must be continually enlarged.

Nor is this policy new in Pennsylvania Railroad history; it has prevailed for fifty years. Thirty-five years ago the Pennsylvania Road took on itself the enormous obligations of the leases and investments of that portion of its present system known as the "Lines west of Pittsburg." There was at the time abundance of criticism for a step declared to be rash and unwarranted; but will any stand forth to-day to declare that the western terminus of the Pennsylvania should have been fixed at Pittsburg? Thirty-three years ago the Pennsylvania Road assumed control of the United Railroads of New Jersey, by which to-day it reaches New York City, and with their control it assumed the obligation of a ten per cent. dividend on the stock. For many years that investment steadily showed a deficit in direct results to that division of railroad, but is there one to-day to call this an unwarranted investment? The connection at Philadelphia by way of the Delaware River bridge with the West Jersey Seashore System was provided at a cost of more than two and a half millions at a time when the president and none of his staff believed it could be made to pay for years; yet the investment paid from the start, and if a slight extra fare were

not imposed that gateway would be swamped with Atlantic City passenger traffic.

The obligations of the Pennsylvania management are toward its stockholders and the investors in its securities; but there is also a very definite obligation toward the millions of people of the West and Southwest, who live along thousands of miles of railroads connecting with or tributary to the Pennsylvania System, and find in it their sole gateway into New York City; and unless these people should still be compelled to change cars and baggage in Philadelphia the acquisition of the United Jersey roads must be justified, and it has by unanimous public opinion received such justification that the Pennsylvania's New York Division is now on an equal plane with the Pennsylvania main line.

Having solved these problems satisfactorily, a further grave question had for twenty years confronted the Pennsylvania management and been the cause of much anxious study. Should the Pennsylvania Railroad remain forever on the west side of the Hudson River? The question was not one to which an answer might lie open indefinitely. Only by immediate action could a passenger terminal in New York City be obtained short of a cost absolutely prohibitive. Should the Pennsylvania Railroad then not endeavor to

improve upon the plans conceived by Pennsylvania forefathers? Should it consent forever to discharge its New York passengers into ferry-boats and land them on the water-line of that city, or should it cross the Hudson River by bridge or tunnel and convey them to the centre of Manhattan Island? The consensus of opinion was that the Pennsylvania Road must ultimately land its passengers at New York, and without unnecessary ado it is making its Hudson River extension by tunnels; and Pennsylvania management will always stand justified in these immense betterments.

In considering Pennsylvania improvements, too, this fact must not be lost sight of: that the Pennsylvania is a high-class passenger route. Its system accounts for one-sixth of the whole vast total of passengers carried by all our railroads. Between the seaboard cities of New York, Philadelphia, Baltimore, and Washington, the necessities of this public service cannot be compared with those of any other in this country, because nowhere else is there such passenger traffic. Speed is, in effect, an American demand; that safety must precede speed as effectively as human ingenuity can contrive is a Pennsylvania maxim; hence a million of dollars to remove one danger from a set of running tracks. Every minute of running time

between such cities becomes inestimably valuable; curvature and grade must be reduced to a minimum to lop off every possible sixty seconds between terminals, when coachload after coachload and train after train of busy people follow one another. Track elevation through intermediate cities helps vastly in this; hence the extraordinary work at Newark, Elizabeth, and New Brunswick, the straightened line at Trenton, and the beautiful four-track stone-arch viaducts across the Delaware and the Raritan rivers. These betterments afford a steel highway practically level and straight from Broad Street in Philadelphia to Jersey City; and at Jersey City even the Hudson River will come out of the account on the day when the Pennsylvania passenger steps from his coach in a Pennsylvania station at Seventh Avenue and Thirty-third Street in New York City, one block from Herald Square.

What less may be said of the freight-traffic requirements on the main line of a railroad system which last year carried one-quarter of all freight tonnage moved by railroads in the United States? In one year these Pennsylvania main line earnings from freight alone exceeded $116,000 a mile, and the total earnings exceeded $150,000 a mile. The present management has been compelled to build what is, in effect, a duplicate

Pennsylvania road over the Alleghanies. Here, again, certain postulates come into the reckoning. If one is to undertake four-tracking in a mountainous country one must be at least sure that his railroad is in its final resting place; the cost of shifting such an alignment afterward would bankrupt a kingdom. All grades then remaining and all curvature must remain forever.

To handle this enormous freight traffic double-tracked and low-grade lines have everywhere been built around congested terminals. The big "Trenton cut-off," branching from the main line at Trenton with a double, low-grade track, strikes westward, leaving Philadelphia out of its course. Twenty-five miles west of Philadelphia it unites again, like a traffic river, with the main line. Again and again this is done; at Pittsburg, at Altoona, these lines are skilfully run completely around overloaded yards. Opposite Harrisburg the west bank of the Susquehanna has been pre-empted, and a new Pennsylvania road is being built with a double-track stone-arch bridge, all its own, near Columbia; and from the crest of the Alleghanies it will soon be possible for the Pennsylvania Company to send freight to tide-water against grades nowhere heavier than sixteen feet to the mile. Near Harrisburg, Pennsylvania engineering has built to itself a monument that will last with the monu-

ments of time. At Rockville, just above the capital city, they have thrown across the Susquehanna a four-track bridge of monolithic stone seven-eighths of a mile long and stepped in graceful arches as enduring as the mountains that look down on the beautiful river. Bridges, like men, have their tables of mortality; but in the expectancy of life accorded to American bridges here is a structure to which no limit of years may be assigned; it has been built to last forever.

At Petersburg, up the blue Juniata, the line forks again, and a new double-track road has been built along the route of the early State public works. It follows the old canal to Hollidaysburg and the "Portage" railroad up the eastern slope of the Alleghanies, flowing, so to say, into the main line again at Gallitzin, where a group of double-track and single-track tunnels take the lines across the Alleghany divide.

From Gallitzin to Pittsburg, down the west slope of the Alleghanies, the original location was considered bold, but the four-tracking has involved work that is gigantic. Where the Conemaugh River bursts through Chestnut Ridge it has cut an exquisite defile known as the Packsaddle. Narrow and forbidding to the construction engineer, the Packsaddle stands like a defiance flung by the mountains. Here the Pennsylvania con-

tractors have gone in with drills and giant powder, and with thousands of men they have literally torn from the cheek of the mountain a shelf wide enough to carry two new running tracks. Before entering Packsaddle, at Bolivar, the lines fork, the low-grade "West Pennsylvania" tracks following the river through Packsaddle to Pittsburg, while the main line, with its four tracks, rises through Packsaddle and, running across country, strikes the Monongahela River near Braddock's Fields. The traveller then realizes what the Pennsylvania and its engineers have accomplished. Where nature conflicts with the railroad operations it has been conquered; yet, while riding upon a road without a superior in any country, the most inspiring scenery surrounds him.

However, unparalleled engineering feats are not the greatest chapter in present-day Pennsylvania management. When Mr. Cassatt assumed executive control of the Pennsylvania System, he found freight rates from end to end of the United States steeped in discrimination. By traffic managers the last pretence of justice in the sale of freight transportation had been abandoned, and Mr. Cassatt, coming in as President of the Pennsylvania, found railroads under the club of the big shippers. The instrument of this rate discrimination has

always been the secret rebate: the upbuilding of one shipper's fortunes at the expense of another, the curse of traffic management, and the most trying problem in railroad affairs. It has been preached upon, inveighed against, and legislated against, all quite in vain. Like the robber baron of the Rhine, the American industrial baron has long laid under tribute the transportation lines of America; the big buyer of transportation has taken the American road by the throat and forced it to deliver. To make the situation more cheerful, the railroad has been held by orators and jurists as responsible for the demoralized situation and for the upbuilding of trusts and monopolies.

Though railroads have been parties to secret rebates, it would be difficult to show that they have always been willing parties. Escape from a situation confessedly intolerable had been sought for years; but escape seemed impossible. The big shipper dictated his terms, and the small shipper and the railroad paid the bills. Congress passed laws of no avail. The courts of the United States had been repeatedly appealed to, but while conditions grew steadily worse they sat with folded arms behind the broad conclusion that transportation was a private commodity which might be sold to one man at one price and to his neighbor at another price.

It has been denied that such is the case, but there are facts that put clearly on record the attitude of American courts during this period of transportation anarchism. In 1879 Mr. Cassatt, then vice-president of the Pennsylvania Railroad in charge of traffic, testified in the equity suits brought by the Commonwealth of Pennsylvania, known as the Standard Oil Inquiries. He told the court without evasion or reservation the exact relations between the Standard Oil Company and the Pennsylvania Road, and his testimony thus became an official record, subject to the use of every Pennsylvania shipper who might seek in court to recover excessive freight charges made upon his particular shipments. Must it not be inferred that if the attitude of American courts promised relief to the small shipper the Pennsylvania Road, with Mr. Cassatt's testimony on record, would have been deluged with suits to recover excessive charges? But were any such suits brought? Not one. Counsel understood too well the hopelessness in that day of a legal appeal to advise any client to proceed against a railroad on the ground of unjust discrimination.

Twenty years later Mr. Cassatt, drawn against his strong personal inclination out of his retirement, was elected to the presidency of the Pennsylvania Railroad System; but whoever else had

forgotten Standard Oil and 1879, Mr. Cassatt had not forgotten. He determined that rate discrimination in the United States, the impoverishment of the investor, the ruin of the honest shipper, and the cause of so many railroad receiverships should cease, and to the task of putting it down he and his associates addressed themselves; and after public prints and public speakers had shouted themselves hoarse; after Congress had failed in solving the problem, as it has always failed; after the courts of the United States had failed, as they have always failed, this railroad man and his associates took the abuse in hand and stamped it out of American railroading.

It was the community of interest plan evolved by Mr. Cassatt that did away with secret freight rates and rebates. To accomplish this, the Pennsylvania, acting with other heavy owners in the railroad field, acquired large interests in the weaker roads, until, with co-operation, courage, and patience the trunk lines, one and all, were brought into a phalanx against the common enemy.

This is the record of Alexander J. Cassatt. He has made unjust discrimination in railroad traffic a thing of the past. He, largely, has made it possible for the public freight rate to stalk abroad day or night, unarmed anywhere in the United States. The traditional Captain of In-

dustry to-day that should attempt to dictate terms to a trunk-line manager would be laughed out of the traffic offices. Mr. Cassatt has fought the fight of the courts, of Congress, of the small shipper, and of common honesty until it has become possible for an American to ship a single carload of freight as cheaply as a trust can ship a thousand; and when the accounts in American railroad history are made up this fact cannot be overlooked, distorted, or forgotten.

Out of a rate situation so disastrous and forbidding, it will hardly be believed that any good could have come, yet one signal good has come. In reducing the income of American roads, low rates have forced operating departments to exhaust their ingenuity in railroad economies. With the income painfully curtailed, every conceivable retrenchment has been found necessary until saving has become in American railroading a science. In operation it has put the American road ahead of all others in the world, although a comparison with English roads will show that everything the American road buys costs more than the English road pays. A single exception may be thought to occur in the matter of coal. Undoubtedly the Pennsylvania Road has cheaper coal than its English cousins, but the American roads, as a whole, have coal as high in cost as the

British. To reflect that our grain to-day is moved at a rate of two and a half mills per ton-mile, that a ton is hauled forty miles for ten cents, is to force the conviction that traffic-rate demoralization has after all brought some compensation. Without this experience American roads might to-day be on a level in operative cost with English roads, doing a much smaller business and not affording our country that industrial advance to which low rates have contributed so much.

THE HARRIMAN LINES

WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
UTAH
ARIZONA
PACIFIC OCEAN
LOWER CALIFORNIA
GULF OF CALIFORNIA
SPOKANE
WAVERLY
TEKOA
COLTICE
WALLACE
BURKE
MULLAN
WINONA
MOSCOW
LACROSSE
CONNELL
GRANGE CITY
POMEROY
DAYTON
DIXIE
DUDLEY
TEKOLTON
ELGIN
PORTLAND
Columbia River
ALLIES
TIGGS
HEPPNER
HALLY
UMATILLA
SHERIDAN
WHITESON
AIRLIE
CORVALLIS
Mt Hood
WOODBURN
SALEM
TALLMAN
LEBANON
SHANIKO
WERDLING
HATRON
LA GRANDE
BAKER CITY
WHITNEY
HUNTINGTON
Salmon River
SILVER BOW
BUTTE
YELLOWSTONE NATIONAL PARK
ANTHONY
MACKAY
IDAHO FALLS
KETCHUM
BLACKFOOT
POCATELLO
McCAMMON
Snake
NAMPA
BOISE
SHOSHONE
Shoshone Falls
PRESTON
HOYER
GARLAND
BRIGHAM
OGDEN
CLEARFIELD
LAYTON
CLEARFIELD
CLINTON
GRANGER
Mt. Shasta
BATTLE MOUNTAIN
PALISADE
LUCIN
Great Salt Lake
ECHO
PARK CITY
SALT LAKE CITY
SANDY
TERMO
CANBY
ORDVILLE
CHICO
OROVILLE
MARYSVILLE
ROSEVILLE
KLAMAS
TEHAMA
FRUTO
WILLOWS
RENO
VIRGINIA CITY
MOUND HO.
AUSTIN
EUREKA
HAWTHORNE
WOODLAND
RUMSEY
CALISTOGA
SANTA ROSA
SACRAMENTO
FOLSOM
AUBURN
LODI
GALT
IONE
DIXON
COTTONWOOD
NAPA
BENICIA
MILTON
YOSEMITE VALLEY
JOE
CANDELARIA
TONOPAH
TRACY
LATHROP
NILES
MERCED
RAYMOND
CARNA DERO
POLLERTY
FRESNO
SAN FRANCISCO
OAKLAND
ALAMEDA
SAN LEANDRO
HAYWARD
ORESPHOP
ALCALDE
COLLIS
CREEDER
CIENEGA
FAMOSE
ARMOUR COMBINE
MIDDLE CITY
RIVERSIDE
GASFORD
ASPHALTO
SUNSET
MOJAVE
OLEUM
HOMPOC
NORDHOFF
SANTA BARBARA
VENTURA
SANTA MONICA
LOS ANGELES
SAN BERNARDINO
CRAFTON
REDLANDS
SAN DIMAS
PASADENA
POMONA
ONTARIO
RIVERSIDE
CORONA
TIOMIN
SANTA ANA
PENITENCIA
LOS ALAMITOS
NEWPORT BEACH
Colorado River
GRAND CAÑON
PHOENIX
GLOBE
CASA GRANDE
BENSON
BOWIE
ARIZONA
MEXICO
GUAYMAS

NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
IOWA
MINNESOTA
Lake Superior
Mississippi River
Missouri River
NORFOLK
OMAHA
COUNCIL BLUFFS
VALLEY
ALBION
GENOA
OCONEE
SPAULDING
SCOTIA
ORDO
BOELUS
LOUP CITY
PLEASANTON
GALLAWAY
ST. PAUL
COLUMBUS
VALPARAISO
LINCOLN
BEATRICE
MARYSVILLE
STROMSBURG
BELLEVILLE
GRAND ISLAND
KEARNEY
NORTH PLATTE
JULESBURG
SIDNEY
CHEYENNE
LARAMIE
LA SALLE
BRIGHTON
BOULDER
PULLMAN
DENVER
LIMON
CHEYENNE WELLS
COLBY
PLAINVILLE
OAKLEY
ELLIS
SALINA
McPHERSON
SOLOMON
CONCORDIA
BELOIT
MILTON VALE
GARRISON
EAVENWORTH
KANSAS CITY
LAWRENCE
TOPEKA
MANHATTAN
JUNCTION CITY
DETROIT
ENTERPRISE
MISSOURI
KANSAS
ORADO
OKLAHOMA
INDIAN T'Y
ARKANSAS
Canadian River
Red River
Arkansas Riv.
Mississippi River
DENISON
DALLAS
LANCASTER
KAUFMAN
FORT WORTH
GARRETT
SHREVEPORT
LOUISIANA
ROSS
BREMOND
NACOGDOCHES
ALEXANDRIA
LLANO
AUSTIN
BEAUMONT
EUNICE
MIDLAND
LAFAYETTE
CARRAUDVILLE
NEW IBERIA
NEW ORLEANS
HENPSTEAD
LAGRANDE
EAGLE
HOUSTON
SABINE
BALDWIN
THIBODAUX
HOUMA
SPOFFORD
CLINE
SAN ANTONIO
CUERO
WHARTON
ROSENBURG
VANDERBILT
GALVESTON
VICTORIA
BEEVILLE
LAVACA
EAGLE PASS
Grande River
GULF OF MEXICO
TEXAS
MEXICO
NEW MEXICO
ARIZONA

LINES.

THE HARRIMAN LINES

In the years of his reign Edward H. Harriman is youngest among American masters of transportation. It is scarcely more than six years —February 1, 1898—since the reorganization of the Union Pacific was completed and Mr. Harriman and his friends took final and formal possession of it. Within that time he has risen to the very first rank of the powers in American railroading.

What, however, is of more vital matter, the record is that Harriman railroading has been uniformly good railroading. It will be difficult to point a case in which, in Mr. Harriman's hands, a railroad or its public has suffered hardship, and the instances are marked in which the immediate benefits of his control have been, to both, enormous.

It is not, then, merely that Mr. Harriman is the owner of seventeen thousand miles of railroad; it is, rather, because every mile of road he owns stands for good railroading, that he is worth estimating. He took over the Alton when it had aged like a puff-ball and was ready to dis-

solve into dust. For years it had been famed as an earner, and where seven and eight per cent. dividends were treasured as an annual return Alton stock was ranked with things celestial. Unfortunately these really unusual distributions were effected by indefensible economies. Railroading should occupy at least as high an industrial a plane as farming, and a farmer that should strip his land yearly of its total produce and give nothing back to the soil would hardly rank as a thrifty husbandman. Good farmers keep up their machinery, buildings, and fences; they fertilize occasionally; but the Alton fertilizing was put wholly into dividends, and Mr. Harriman bought a road that had not alone let bridges, tracks, and rolling stock run down, but had sold even terminal rights, while distributing eight per cent. to stockholders. Without delay or hesitation he set about making of the Alton the best possible road of its class, and its class is the first. He has overhauled the system completely, and put it physically a little in advance of every competitor. To instance: For thirty years the Alton had been strong in a territory possessing the richest coal deposits in Illinois, and not until the Harriman forces took hold of the road had it ever developed a coal business. Not only has the new Alton been equipped with what it never before had, cars and

motive power to handle this traffic, but its engineers in rebuilding the line show the lowest maximum grades from the Illinois coal fields into Chicago. Beginning with nothing, the new owners have within five years developed a coal traffic that already ranks second in volume among the soft-coal roads of its territory.

While, in a legal sense, a railroad may be quite within its rights in declining to provide for the handling of such traffic, deeming it of small profit, and may legally decline to expend earnings in reducing grades and maintaining right of way—in a word, in improving its facilities for doing business—the public dependent on such a road for transportation will feel, rightly or wrongly, that they are entitled to industrial opportunities as good as those enjoyed by more fortunate neighbors: that their railroad should be kept in the front rank just as their homes and streets and farms are kept; and the attitude has a show of reasonableness. These are points which the new policy of the Alton has sought to meet, and that its local public appreciates the effort is shown by the steady development of industries of every sort along its line. Out of a very heavy passenger traffic on the Alton ninety per cent. originates in its local territory. Under Harriman management bridges have been eliminated, curves

cut out, heavy steel rails laid, new car equipment provided, and motive power has been made to conform to the highest standard. Mr. Harriman has made of the Alton practically a speeding track across Illinois and Missouri, and some conception of the undertaking may be had when the fact is stated that to do this has cost him $19,000 a mile—more money, mile for mile, than has gone into improvements on any other portion of his railroad holdings. What this means to that public which must depend on the Alton for its railroad facilities is a part of the Harriman railroad record. Alton shippers can get rates that put their products on an equal basis in competitive markets because the road can do business against all comers.

But Mr. Harriman controls also the Union Pacific and its tremendously powerful California ally, the Southern Pacific, as well as the Alton and the Kansas City Southern. Whenever freight is to be moved to or from the Pacific Coast, Harriman lines, from their long intrenchment and their vigorous condition, are first among those to be reckoned with; and in the big system that Mr. Harriman has built up they all group strategically around that road the very name of which, in the story of the American railroad, is a name to conjure with—the Union Pacific.

Of all American roads the Union Pacific has

traditions the most spectacular. Its undertaking involved the daring of visionary men. The conception of such a road was among the earliest of American dreams, and while its working out was a national pride it became also a national scandal.

For nearly thirty years after being completed the Union Pacific was operated with varying fortunes. In that sensational period it had shown great earning power but had been at times badly managed. It had played a part never to be forgotten in the development of the West; but its strength was bowed under an insupportable burden of Government debt and Government domination, and the sins of its builders were visited a thousandfold upon its hapless head. It had opened to settlers vast regions of fertile country and brought a new world into touch with metropolitan centres and markets. In every section traversed by this earliest transcontinental line cities and towns had sprung up and prospered, and prosper to-day. The Union Pacific was the West of our pioneer generation, and neither the misfortunes of the one nor the triumphs of the other can ever be divorced; indeed, the industrial and intellectual prosperity of the West is bound up in the story of the Union Pacific.

Taking the historical trail of the explorer, the adventurer, and the Mormon of the early day, the

road followed the valley of the Platte, then a sandy waste and now an irrigated garden, far beyond the hundredth meridian, and pre-empted a railroad territory that under supportable conditions would have given it a position at all times impregnable. But its changing owners, busied with secondary schemes, allowed valuable local territory to be filched from it by the Burlington and the Northwestern, leaving the Union Pacific to stretch its way from the Missouri without one good feeder where it might have had a dozen. With these changing fortunes, the Southern Pacific, California ally of the Union Pacific and its sole outlet to the coast—its absolute dependence for through traffic—became gradually a covert enemy, and building its own lines to the South, diverted traffic as much as possible from the patient Overland route. Left thus to the barest of its own resources, strong in its geographical position and weak in every support that a railroad ought to count as strength, the Union Pacific struggled on until 1893, and a receivership closed its first chapter. It was a strange chapter; nothing quite like it in all other American railroading. But it is closed, and the men who, leading forlorn hopes, threw their fortunes, their health, their reputations into that thirty years' struggle will never be forgotten. Monuments to

their heroic enterprise dot the country between the sands of the Missouri and the coast of the Pacific. They laid the foundations of a commonwealth in a wilderness.

Perhaps the time had never come in all that period when it was possible to raise this prostrate Western giant to its place among American railroads. Many men had contemplated it; great men had at times had the road's management. Possibly, one and all, they shrunk from the herculean task of acquiring the Southern Pacific in order that their property should not be hung up with a Western terminus in the Utah desert; of a final adjustment of the Government debt; and of the rebuilding of the great road across the Rocky Mountains. At all events, in all of those thirty years no sufficient capitalist, no aggressive railroad owner did grapple with the difficulties until Mr. Harriman, almost yesterday, laid his hands upon this tremendous property and made it the Prussia of his railroad empire.

The Union Pacific had at the time sounded the depths of a financial crisis. For five years it had been in the hands of receivers. A lack of funds had cramped its natural effectiveness, and courts had divided its garments among warring creditors until it was reduced to the plight of a strong man stripped of everything.

The country, by an unfortunate coincidence, was in a condition almost as deplorable. Its industries lay prostrate under the effects of the most far-reaching panic since 1873. Not alone was the monetary stringency acute; for the first time since the Chicago Haymarket riots men had begun seriously to estimate the symptoms of discontent among that class of our people most susceptible to the influence of industrial agitators. In the railroad world troops had been called out to curb the violence of mobs; in the political world new counsellors had arisen with doctrines so sudden and audacious that business men stood confounded. A great political party had surrendered completely to a leader who, with some fantastic show of success, urged his own candidacy for the Presidency of the United States on the strength of his explicit pledge that if elected he would do his utmost to debase the national currency. With apprehension the keynote in financial circles, business everywhere in paralysis, capital hiding in secret places, cash hoarded in safe-deposit vaults, and gold already at a colorable premium, Edward H. Harriman planned and laid the foundations for a movement that was almost at once to elevate him to a first place in the railroad world.

To reflect that this has all taken place within

ten years is to cast upon it the shadow of incredibility. When the hour for such an undertaking was ripe Mr. Harriman had to look but five years ahead for justification of his venture. It is a commonplace that times of depression are the times to buy as those of prosperity are the times to sell. What men lack when the outlook is gloomy is the courage to make their convictions operative. It is not that other men do not realize such opportunities or that they do not see during periods of prosperity the coming of that inevitable day when, through monetary stress, good properties may be had for little price; the difficulty is when the day comes that out of one thousand men who have foreseen it but one has the decision to back his judgment. Mr. Harriman possessed the decision; that is why to-day, under brighter skies than those of 1896, other men are reading about Mr. Harriman's achievements instead of Mr. Harriman reading about theirs.

Courageous as the idea was in its conception and execution, when the enormous means necessary for buying had been provided Mr. Harriman's work had but begun. He was possessed of a group of exceedingly valuable properties, but all of them stood in urgent need of rehabilitation. He had in the Pacific roads and the Alton

the corporate titles, the rights of way, and the opportunities; such incidental acquirements as rails, bridges, and rolling stock could not seriously be counted into the bargain, for they had seen their day. It remained to transfer them quietly but firmly to the railroad back yard and cheerfully to start anew. Moreover, in railroad practice new standards of track grades and curvature had been set, which must be met in order to compete with the best roads, and those exacting standards were uncommonly expensive. Again, in a crisis equally vital, Mr. Harriman showed the stuff of the unusual man. He decided that his roads must be made good roads, the best of their kind, and for this purpose he made figures. Not all of them can be considered here, but one most interesting estimate was this:

"For my immediate necessities (so to say) in railroad rebuilding: One hundred millions of dollars."

This, I take it, above all else in the record of his railroad operations gives the man his rank among really great railroad men—the Vanderbilts, A. J. Cassatt, James J. Hill, Huntington, Garrett, Thomas A. Scott, and the Goulds. It must not be forgotten that other able managers and operators have at different times controlled or owned the Union Pacific. Mr. Harriman was

the first to make of it a road of the highest rank physically—a power in the transportation world worthy of standing, conditions allowed for, with the New York Central lines or the Pennsylvania lines.

He needed, for his immense work of making over these many thousand miles of railroads, constructionists of the highest order, and these, also, he gathered about him. The Alton he gave to S. M. Felton, the Union Pacific he gave to Horace G. Burt, the Southern Pacific to Julius Kruttschnitt, and the Kansas City Southern to S. R. Knott. It will be observed that all of these men are able constructionists, not only presidents or vice-presidents in the sense of being strong executive officers, but highly trained engineers, capable of doing themselves anything they may order done. They, in turn, chose the most capable men they could find as chief engineers of their various lines to carry out the Harriman plans—Baldwin of the Alton, Hood of the Southern Pacific, Berry of the Union Pacific: all men that rank, among men as strong as American engineers are admitted to be, as exceptional—and with the money ready each man set about his work to make practically new railroads of the Harriman group.

Horace G. Burt, then president of the Union

Pacific, had already left his impress as an engineer on the Chicago and Northwestern Road. On him fell the consideration of the enormous engineering difficulties involved in crossing the Rocky Mountain divide. To him must be given credit for the boldness of conception which marks the extraordinary improvements on the new line, and it was his task to convince the new owners of the wisdom of so heavy an outlay. Under his active direction contractors raised an army of laborers to subdue the mountains and assembled an equipment of modern machinery much of which was then used for the first time in railroad building. Under Burt these Western men completed in less than two years the work of five, and every day the heavy traffic flowed without interruption over the line they were rebuilding.

It is not, perhaps, commonly understood that the highest barrier presented to the Union Pacific in its transcontinental run lies immediately west of the plains about Cheyenne, where the line strikes that secondary range of the Rockies known as the Black Hills. What makes the ascent of these hills of especial difficulty is a great elevation coupled with unusually short slopes. Just here, at the outset almost, the Union Pacific rises to its greatest height above the sea, and here, in the rebuilding, lay the problem before Berry, chief engineer, as

to how the grade of this granite summit might possibly be reduced. New limits had been set to the gradients of the proposed improvements; but it is one thing in a directors' meeting to adopt a grade over the Rockies of forty-three feet to the mile and quite another to go into the Rockies and run it. The chief engineer had to match his wits against those of engineers who, a generation earlier, had laid out the pioneer line and done their work well; thirty-five years of reflection, observation, and criticism from the best constructionists in the world have failed to develop flaws in this earliest effort of Americans at bridging the Rockies. The Rocky Mountain engineer of that day had command of practically all of the advantages that those of to-day have, save only access to Mr. Harriman's pin-money; even then the difficulties of getting a better grade than the first one across the hills proved enormous. To find the line that Berry determined he must have, he sent good men into the hills only to be told on their return that where he wanted a line there was none. But when they tried to maintain this, the personal equation, that subtle and incalculable factor in men which in the overcoming of difficulties makes the slight difference between success and failure, intervened. The chief engineer, undaunted, refused to abide by the

findings. He sent the engineers again; the second time they brought the line he knew must be there.

It involved staggering estimates. The Dale Creek crossing, just beyond Cheyenne, called for a single fill nine hundred feet long and one hundred and thirty feet deep. In these granite wastes the engineering figures assumed, at once, unheard-of proportions. Cubic yards went into the calculations in millions instead of thousands. Two creek crossings called for eight hundred thousand yards of embankment. Two miles of new line required the moving of seventeen hundred thousand yards of material, and of this three hundred thousand were of solid rock. Two fills within these two miles swallowed a million cubic yards. To eliminate three heavy reverse curves and two bridges a summit cut was required, eighty feet deep and a thousand feet long. The springing charge for a single cone of rock was a thousand pounds of giant powder, and the mountain was hurled into the cañon with twenty thousand pounds of black. For these unprecedented levellings of the continental summit new devices were constantly brought into play. Time was an essence of the undertaking, and the American contractor, following loyally the American engineer, as he has always followed him, stooped like an

Atlas and took upon his shoulders the burden of the plans.

Grading machines and dump wagons were sent into the hills in trainloads. Steam shovels, the leviathans of the railroad camp, crossed the mountains in processions. They scooped the borrow pits, cut the shale from the tunnels, dug the Sherman ballast, and loaded even blasted granite upon cars out of the rock cuts. Track-laying machines flung out rails on one side and ties on the other like sandwiches. At one of the vital points, Chicago men, the MacArthurs, took the heavy work, and to make a three-hundred-thousand-yard fill with an embankment of one hundred and thirty-eight feet, MacArthur, to complete his contract on time, threw his own temporary suspension bridge across the thousand-foot cañon and ran his dump cars out upon his own rails and cables. Track laying, ballasting even, was pushed across the Rockies in midwinter. At the new summit the last hill was drilled and a tunnel eighteen hundred feet long put through primitive granite. Here the Harriman engineers scaled two hundred and forty-seven feet off the highest elevation at which the road had formerly crossed the continent; then came their task of getting gracefully down the western slope of the hills to the Laramie plains.

There is nothing less showy in the rebuilding of the Harriman lines and nothing that is more of a triumph than this feat of Berry's in getting into Laramie. He has used here every trick in his bag, and after moving five millions of cubic yards of earth and rock to accomplish his purpose he comes down into Laramie with a forty-three-foot maximum grade eighteen miles long. So close is the cloth cut for this entire distance that not one rail-length of level track could be conceded for stations; they take their chances on the grade as best they can. Providence may, indeed, some time shift the axis of the granite anticlinal now so skilfully crossed at Sherman, Wyoming, and new dispositions may be called for; but until such an upheaval takes place Berry's Laramie grade is likely to stand.

The whole road from this eastern approach to the Black Hills, far out to Medicine Bow on the Laramie plains, shows everywhere the chisel and the straight-edge of the Harriman engineers.

There are but two pieces of track, both very short, on the entire main line where the forty-three-foot grade is exceeded. Curvature has had to go with the heavy grades, and between the Black Hills and the Wasatch Range seven thousand degrees within the last five years have gradually disappeared. At one point the new line

within a distance of four miles crosses the old one seven times; the Hanna cut uncovered an eight-foot seam of coal; a Green River cut revealed wide deposits of petrified fish.

First and last the contractors uncovered a little of everything in the Rockies, from oil pockets to underground rivers, but in the Wasatch Range, in boring a six-thousand-foot tunnel, they struck a mountain that for startling developments broke the records in the annals of American engineering. It was here that the underground stream was encountered, but this was a mere incident among the possibilities in the mountain. The formation is carboniferous, thrown up in the Aspen Ridge at an angle of twenty-five degrees, and it includes shale, sandstones, oil, and coal. To bore a hole through the mountain at a depth of four hundred and fifty feet from the highest point was not difficult; but the curious thing was that, after being bored, the hole would not stay straight. The mountain, reversing every metaphor and simile of stability, refused to remain in the same position for two days together. It moved forcibly into the bore from the right side, and when remonstrated with stole quietly in from the left; it descended on the tunnel with crushing force from above and rose irresistibly up into it from below. The mountain moved from every quarter of the

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compass and from quarters hardly covered by the compass. Workmen grew superstitious, contractors suffered chills, and engineers stood nonplussed. Starting in huge cleavage planes, the shale became at times absolutely uncontrollable. Wall plates well fastened into regular alignment at night looked in the morning as if giants had twisted them; 12 x 12 hard-pine timbers laid skin to skin in the tunnel were snapped like matches by this mysterious pressure. Engineers are on record as stating that in the Aspen tunnel such construction timbers were broken in different directions within a length of four feet. An engineer stood one day in the tunnel on a solid floor of these timbers, when under him, and for a distance of two hundred feet ahead of him, the floor rose, straining and cracking, three feet up into the air. Before the tunnel could be finished it became necessary to line over 700 feet of it with a heavy steel and concrete construction. Gases caused frequent explosions and only constant vigilance prevented the most serious disasters to the men. When in Valhalla the heroic spirits of the American section of civil engineers assemble it will be for the shades from the far Rockies to recount the tallest stories.

Through a more forbidding country, and under difficulties no less formidable, Hood's Southern Pacific corps has made over almost wholly the

Central Pacific link of the Harriman lines. Across Nevada the men have taken out more than thirteen thousand degrees of curvature and three thousand feet of rise and fall. In a distance of four hundred and fifty miles on the old line they have built two hundred miles of entirely new road, bored two miles of tunnels, and put eight million pounds of steel into bridges. To do away once and forever with the terrific grades and curves made in pushing north around the Great Salt Lake, the Southern Pacific engineers have drawn a red line from Ogden straight across the lake and the desert to Lucin, Utah, cutting forty-four miles of track out of a hundred and forty-seven and eliminating four thousand three hundred degrees of curvature and over fifteen hundred feet of rise and fall. They have run a trestle twenty-three miles long across Salt Lake through water thirty feet deep, taking railroad trains further from land than they have ever yet been run; and the success of their undertaking arrested for a moment the attention of the railroad men of America.

Wherever the Harriman control has been exercised the policy of physical betterment has been decisive and the results are imposing. Whatever changes in control may come to the Alton, for example, it can never be forgotten that it was

Harriman who made of it a great railroad. Mr. Harriman has made good roads the characteristic of his system, and the roads have responded strongly to the new impulse. The enormous expenditure of above $100,000,000 for improvements in a little over three years seems to leave their treasuries overflowing. The Union Pacific now owns its Northwestern link, the Oregon Short Line, and together the Union Pacific and the Short Line own the Oregon Railway and Navigation Company. In addition, the Union Pacific has cemented a kinship with the Southern Pacific by the purchase of the Huntington interest of $75,000,000.

It stands to-day the monetary fortress of the Harriman lines, holding stocks and bonds in its treasury with a par value of $341,000,000, and they group loyally about it North and South and West to compose to-day the most powerful single interest in the transcontinental field.

THE HILL LINES

THE HILL LINES

Can anything fresh be said about James J. Hill? What railroad man since, perhaps, the first Vanderbilt or Gould has filled so large a measure of notice? Have we, indeed, a public man concerning whom anecdotes have been more searchingly recounted, or whose affairs have supplied so much material for first-page newspaper stories?

Canada gave Mr. Hill to us; and we, in turn, have been generous with the Dominion, for we gave to her Sir William Van Horne. It would be temerity to say which has the best of the exchange; this thought only may be ventured—that neither side has ever suggested trading back. The work of these two men, and what they have accomplished, is much the same. The contrast becomes noticeable only when we consider how the two have been repaid by their adopted countries. They are each railroad builders, organizers, and operators, and of the first order; men whose rank in the Bradstreet of railroad men is AaAaA1. The expatriated American has been led for distin-

guished services before a grateful sovereign to kneel and arise a knight of her realm. Mr. Hill's sovereign, the State of Minnesota, has periodically led her greatest son out as a public culprit, with a rope around his neck, to do penance for his services in helping, more than any other one man, living or dead, to make her all she is in wealth and development to-day.

Mr. Hill, however, has probably acquired humility; certainly he has long been patient of criticism. What is remarkable in his make-up is his boyish loyalty to his adopted country and its people, and one can speak against Minnesota or Minnesota people only at the risk of waking Mr. Hill up very seriously. Other men, tiring of continued abuse, get angry, slam their suits of project and ambition on the table, and bid good-by to the annoyances of the game; Mr. Hill only smiles, calls for fresh cards, and deals again.

I have called him patient of criticism. About 1873, when still a steamboat man, he had got together $100,000. There was then in Minnesota a little railroad called the St. Paul and Pacific that had been run probably by the legislators or statesmen of that day; at all events, it was both bankrupt and six months behind in its pay-roll. To buy it Mr. Hill needed $500,000. No one in Minnesota would lend him so much; probably

no one had so much to lend. He tramped back to Canada and persuaded the Bank of Montreal, somewhat against its inclination, to let him have the needed sum.

For that loan the directors of the Bank of Montreal were seriously criticised. There were men as far back as 1873 to laugh at Hill's projects. These said that his ridiculous purchase would ruin not only him but his Canadian friends; that the road never had paid and never could be made to pay. Yet that Jim Crow line of the seventies was the foundation of the Great Northern System, with its rails spreading across Dakota and Montana and opening on distant Puget Sound —the road that has never, from the first years of its organization, failed to pay regular dividends, and whose shares command a market and a premium when good railroad shares go begging. Nor is this all. This great Northern System earned the money that made it possible to make a Hill line of the Burlington, with its tremendous investment of two hundreds of millions, and has made Mr. Hill and his friends a dominant interest in Northern Pacific. In this way Mr. Hill repaid not only his Bank of Montreal friends but that timid element among them who feared the loss of their $500,000. He has returned their money and made the men that then stood by him mill-

ionaires, and they are millionaires and lords of the British realm to-day.

After 1873 he moved again decisively. He declared in 1879 that he meant to put the Great Northern across the continent. His friends stood surprised, and again men laughed. Hill, they said, was insane. No transcontinental road had yet been built without milking the Government; that was the primer of transcontinental railroad effort. Either the United States Treasury must be looted or an enormous grant of public lands coaxed from Congress. Did Mr. Hill, they asked, purpose to build a line with his own money to compete with these subsidized whales? Moreover, did he propose building his line north of the Northern Pacific, which was already so far north that its country would not grow wheat? From conclusions drawn in this way it remained only to nickname the new venture, and the Great Northern was dubbed "Hill's Folly"; but he had set his mind to cross the continent.

In 1893, again an ominous date, he put his foot on the Pacific Coast with the only line that ever got there without the aid of a dollar of public money or an acre of public land.

When he had reached his goal there came the prostration of the country's industries due to the late panic. Railroads everywhere fell into re-

ceivers' hands. Receivers came to the Santa Fe, receivers to the Union Pacific, receivers to the Northern Pacific; but no receiver to Hill's Folly. Mr. Hill kept his interest paid, and through the panic years made just a little money. He managed his road, managed his borrowing, built a little branch once in a while, and so astonished the less fortunate owners of the Northern Pacific that they came from Berlin all the way across the Atlantic to beg the owner of Hill's Folly to take hold of their road and manage it.

Mr. Hill was not, even then, unknown on the Continent. He does his own financing. If he needs money he goes to London or to Berlin and gets it. He works with bankers as partners in great undertakings, but he needs no syndicates to underwrite his securities and pays none to do so, and he weathered the panic of 1893 with only that loyal band of friends behind him who, perhaps, were more beholden to Mr. Hill than he to them. This steamboat pioneer, who in so many ways suggests that earlier famous steamboat pioneer, Cornelius Vanderbilt, is not only builder and operator but financier as well.

Something more than executive ability is needed to succeed in fields so widely different, and to his aggressiveness as an operator Mr. Hill adds notable sagacity. His judgment has never been

seriously at fault in his undertakings. To a man who knew the North less thoroughly the project of putting a railroad across the continent above the forty-eighth parallel must have proved, as all predicted it would, disastrous. But Mr. Hill knew the country and its limitless possibilities. With his grasp of things he could hardly have failed in any undertaking; he would have made a great farmer or miller or merchant. Long before this man put his road across the Rockies he had tramped on snowshoes over the drifts of the future wheat belt of the world, and ridden for days behind dogs across the white and silent wastes of Canada. It was not on sunny seas nor under summer skies that Mr. Hill sought fortune; but facing the wind, heading for the wilderness, planting outposts of civilization in the teeth of the blizzard and the frost; and, with the North conquered, there remained one more decisive step—to connect it commercially with the corn belt and the manufacturing industries of the United States.

There never was but a single justification for putting the Great Northern across the continent—the timber of the Puget Sound country. Of local business on such a line there could be for many years only a little. But the full horizon of an undertaking does not open at once on the vision

of even the wisest of men. The operating of the Great Northern for a few years developed the imperative need of some railroad link that should connect it directly with the industrial centres and the farming country of the Middle West. With his big railroad running from St. Paul to Puget Sound, Mr. Hill knew that if he could not haul the Washington and Oregon pine East there was really not much of anything else to haul. Nor would this traffic stand a rate heavy enough to cover bringing it East in a car that must go back to the coast empty. Thus, not only was he forced to provide a market for the Sound lumber, but likewise to provide westbound traffic for the return trip of his freight trains. Mr. Hill faced an exacting situation.

His own story of the efforts he made to meet this difficulty should be printed as a treatise for young traffic managers. It is impossible for an American to read it without a thrill of industrial pride that such men as this are fellow-countrymen. To discover, to develop, and to create Oriental traffic Mr. Hill sent men to China and to Japan, and maintained them there to investigate trade conditions. He had men in the Orient whose business it was to get a manifest of every ship that cleared a Japanese or a Chinese port; to find not alone what the exports and the imports of

these countries consisted of, but where the exports went. He put a traffic representative in the Orient, and covered the Eastern United States with industrial ants whose work it was to turn traffic to the Great Northern. His agents found out what the factories of New England were making, and in China and Japan his men sought an Oriental market for the stuff.

Of his traffic department he asked nothing that he could not bring about himself. Distinguished Japanese guests of Mr. Hill's in 1896, building new roads in Japan, were not allowed to leave for Europe to place their orders for Belgian or English rails until, after dinner, they had had a little talk with him about it. As they were to spend a day or two in his company he asked if he might see what could be done on American rails. So considerate a host could hardly be denied, and Mr. Hill cabled friends in London for the best quotations on Antwerp and Middleboro rails, and the best charters to Yokohama. He found the foreign rails could be delivered there at about $29 a ton. He telegraphed Chicago and told the steel men that if they would make a price of $19.50 on American rails the Great Northern would lay them in Yokohama for $8 a ton. The Chicago men made the price, and Mr. Hill's railroads and steamships landed in Yokohama 15,000

tons of Chicago rails, the first American steel rails ever sold in Japan.

The transaction was only an incident, but it illustrates Mr. Hill. By this time even Japanese manufacturers had been attracted by the Great Northern policies. Passing across the American continent, a party of them were gently but firmly detained by this master builder of trade, who, fixing on them an ancient mariner eye, asked about the poor cotton they were spinning at home—the India cotton with the short staple that made the poor yarn. The Japs were disposed to stick to their cheap cotton, but they were not so easily to escape. Rather than let them go, Mr. Hill persuaded them to try one shipment of American cotton upon his guarantee that if it should not prove profitable to mix our long-staple cotton with the short staple from India he would pay for the trial shipment himself. Such was the beginning of a little cotton business with the Orient. Mr. Hill was not called on to pay for the trial shipment, but since then raw-cotton exports to Japan have reached as high as 160,000,000 pounds in a single year, and of this quantity Mr. Hill's lines carry three-fourths. The story of cotton piece goods, which go to China, is much the same. When Mr. Hill reached Puget Sound we were exporting 65,000,000 yards; in

1902 we exported 335,000,000 yards. To understand his influence in bringing this about look up the percentage of this product that goes by way of Puget Sound. Practically all of this increase in cotton traffic came about through the planning of the indefatigable Mr. Hill.

To appreciate, also, what this particular traffic means, consider where the raw cotton of this country comes from and where Mr. Hill's railroads lie, on the Canadian border. Unless he should undertake to export Florida pineapples to Siberia, how could he possibly stir up trade between two corners of the world more remote from his own stamping-ground? Moreover, a man familiar with railroad conditions in the South, if asked why freight rates on cotton are high, will answer that it is not alone because cotton is hazardous as a commodity and represents, pound for pound, ten times the value of corn, but that the market is a limited one; that if all the cotton lands in the State of Mississippi were cultivated they alone would supply the American cotton now used in the world. There is no incentive, unless the market can constantly be enlarged, for Southern roads to carry cotton cheaper. Here, then, comes a railroad man from the far Northwest, and single-handed supplies the primary incentive; and if the trade with the Orient ever

becomes considerable, Southern cotton will be marketed cheaper everywhere because a man whom cotton growers never saw, and whom thousands never heard of, is now sending their product from Galveston and New Orleans, on the Gulf of Mexico, to Yokohama, Japan, by way of Puget Sound. Observe, too, the exceedingly delicate adjustment of traffic conditions; this happens not because there are not equally strong railroads to the coast further south, but because those roads lack the Puget Sound lumber to bring east in the cars that take the cotton west, and it costs practically as much to pull an empty car as a loaded one. The Santa Fe, therefore, prefers delivering Texas cotton to Mr. Hill's Burlington road at St. Louis to hauling it to California.

But neither a fortuitous shipment of steel rails nor a modestly growing cotton business by any means solve Mr. Hill's traffic problems. It is a question of unceasing effort to build up commodity business. He carries nails and wire, in great quantities, from Lake Erie to Hongkong for forty-five cents a hundred pounds. A city man can hardly get a keg of nails from a downtown shop to his suburban home for less than Mr. Hill carries a similar keg across a continent and an ocean, ten thousand miles. Such a rate, of course, is very low, and calls for the closest

figuring to leave a margin of profit. The Hill lines are compelled, to use his own forcible words, to look for anything and everything that will supply westbound business, whether destined for the Pacific Coast, for Alaska, Honolulu, China, Japan, the Philippines—anywhere, if they would keep their freight cars loaded both ways. Moreover, if an international traffic is to be established the first absolute requisite is permanent rates: not merely day in and out, but substantially year in and out; and Mr. Hill found that unless he could make his rates permanent he could not hope to succeed in his huge enterprise.

Thus a military necessity confronted him: that of freeing himself from the uncertainty of joint rates which might be one thing to-day and a wholly impossible thing to-morrow. He needed access over his own rails to Chicago and St. Louis and to the factories and farms of the corn belt. In a word, he must be able to make his own rate from where the traffic originates to where his shippers market it. Connecting lines whose interests might lie to-day in a favorable joint rate to the Orient might to-morrow conclude that there was nothing in the business, and withdraw it. Mr. Hill, in order to hold his ground, saw himself compelled to extend his lines into the lower Lake country and the Mississippi Valley.

The conclusion forced him into the greatest undertaking of his already remarkable career. To build such a road as he required would be a matter of years; he needed one ready-to-wear, and he needed a great deal of money to make the purchase. This time $500,000 would not do, nor a million, nor several millions; he needed now hundreds of millions; but his credit was still good, and, taking in a reliable partner whose interests coincided with his own, he bought the Burlington Road.

The story of the Burlington is in itself out of the ordinary. It has always been aggressive in its management and peculiarly successful in its ventures. Any Western railroad man esteems himself fortunate when he can get business away from the Burlington. To take a fall out of the Burlington is a feather in any traffic manager's cap, and it is odds that for some time thereafter he will be kept busy in holding his ground, for, unless a very handy man, he is likely to be thrown on the defensive at once. This curiously strong grip on business has never been advanced by the cutting of rates, but rather by a keen realization of the fact that business, like kissing, goes by favor. The Burlington management has always been characterized by astuteness, and its people have cultivated the art of making friends. Mr.

Perkins, who made the wonderful road what it is, never liked to have enemies or trouble. His motto was, briefly, eighty per cent. of the business and peace; and it is astonishing how closely he approximated his ideal. Somehow, too, the Burlington Road succeeded in creating among its men an *esprit de corps*, a loyalty to itself, so that former Burlington officials refer with certain pride to the old road. When one meets, East or West, on American roads a Burlington man he is conscious, too, of a consideration of the sort that asks, Now, what can I do for *you?* rather than, What can you do for *me?* And, as I shall note hereafter, so widely have the graduates of the road been distributed in railroad circles that at one time, not many years ago, the executive officers of each of our transcontinental lines were Burlington men. It is not fanciful, then, to assert that, in addition to 8,700 miles of track and equipment in prime condition, Mr. Hill took over in the good-will of the Burlington, a valuable asset in itself.

Geographically, Mr. Hill found that the road lay precisely fitted to his Northern needs. The Burlington, with a base on the Great Lakes, extends into the Rocky Mountains. It is powerful on the Mississippi River, and on the Missouri it is first. Its mileage in the State of Nebraska alone would give it a trunk line from New York

to Salt Lake City, and its Iowa mileage added would extend such a line to Los Angeles or Puget Sound. One arm of the Burlington connects Chicago and Denver; another, striking from St. Louis and Kansas City, enters Nebraska at its extreme southeastern corner, winds through the Black Hills of Dakota and Wyoming, and crosses the Crow Reservation in Montana to unite with the Northern Pacific. Here its right of way, lying within the shadow of the Big Horn Mountains, drops into the valley of the Little Big Horn River and follows the fatal path that Custer and the Seventh Cavalry followed in June, 1876. It is historic ground. Amid the wastes of this far and silent desolation the traveller finds a soldiers' cemetery. A tragic feature marks its headstones; they are nameless, for here Custer with 260 men, surrounded by the Sioux and Cheyennes, made his last stand, and none survived to tell the story. Where, long after the fight, each skeleton, bleached by the summer's sun, lay on the field, a stake was driven and a stone marks the spot.

This is the link of the Burlington that connects the Puget Sound roads with the Mississippi Valley and the Great Lakes; with the Western smelters at Denver, in the Black Hills, at Kansas City and Omaha, and at Aurora, Ill.; with the cotton roads at St. Louis and Kansas City;

with the packing-houses at Omaha, St. Joe, Kansas City, and Chicago. On the Mississippi River the Burlington taps every town from Minneapolis to St. Louis, and it reaches a large percentage of the manufacturing industries of Illinois.

But of more vital importance than all these things, the Burlington covers the lumber-consuming States of the country. It counts 1,400 miles of trackage in Iowa, a State that is not only the greatest consumer of lumber in the Union, but exceeds in its consumption any three States. Mr. Frederick Weyerhauser has said that he would rather have the lumber trade of Iowa than that of any three other States together. Mr. Hill is probably right, then, in saying that for the development of *his* natural resources, so to call them, the Burlington is of as much value to him as perhaps all other Western roads combined.

With Michigan already on the point of consuming more lumber than it supplies, the significance of his early foresight in building into the Puget Sound timber country, and later in securing an outlet for its timber through direct entry into the big domestic lumber markets, becomes apparent. Of equal moment is the enormous Oriental traffic Mr. Hill had created in American flour. American flour gets only as far as the Chinese ports and along the coast; local taxation pre-

vents its reaching the interior of the empire. Even on the coast it is used rather as a confection than as a staple for bread; still, last year Puget Sound exported 2,000,000 barrels of flour to the Orient. Ten years ago Mr. Hill found Puget Sound wheat going to Liverpool by way of Cape Horn. To-day it is practically all ground at home into flour which his boats carry to China. These Sound exports of flour have in ten years increased 617 per cent. The Hill roads are putting into commission a line of new steamships for Oriental traffic, two of which, taken together, exceed in capacity the combined tonnage of the entire Canadian Pacific fleet from Vancouver. Landing, as he is, then, American flour and nails in Hongkong and, save for the present hostilities, American cotton and rails in Yokohama, bringing the forests of Washington to the prairie farms of Iowa, stirring up trade in every port of the Far East and in credit among the most careful bankers in Europe whose money he is borrowing on his own notes to develop the Northwest, is it possible that a charge of plotting in restraint of trade can successfully be maintained against this man? Has Mr. Hill burned any one's refineries, blown up any rival railroad bridges, bought any lines to dismantle them, driven other railroads out of business, or wrecked them to freeze out stock-

holders and bondholders? It would be competent, conceivably, for the managers of other railroads, the Canadian Pacific, for instance, to ask that Mr. Hill be restrained from further attempts at getting *their* trade. That which will be incredible to men fifty years from now is that he should have been assailed as he has been in the Merger Case by the circumstance and dignity of the United States as an industrial wrong-doer.

It should console Mr. Hill, however, to reflect that in the canonization of really great men the first appropriation of public moneys is for fagots, the quarrying of the marble usually being left to the third and fourth generations. Perspective is needed for the right estimate of extraordinary men, and it is supplied by time; our mental mirrors are fitted to reflect the ordinary sort of mortals others blur on them. We call Mr. Hill, freely, Jim Hill, as the Genoese, perhaps, referred colloquially to Chris Columbus. Chris was at too close range for them quite to comprehend. Spain doubtless at that day was filled with bigger men than the Italian adventurer; yet history, forgetting their names, writes his in full.

How can the story of the Northwest ever be written without the story of Hill? When he put his road across the continent he stood on end the railroad egg of the North and showed men

how simple and easy it was, after all. Napoleon's first question was, What has he done? That question must always be answered in attempting fairly to place Mr. Hill among the men who have developed and created American trade and industry. He is the last of our great railroad pioneers. We cannot hope for more men to fill such niches in our history because there are no more such niches to be filled. There are no longer within our borders railroad wildernesses to be explored; of these Mr. Hill has thrown open the last.

THE FIGHT FOR PITTSBURG

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During the closing days of the final session of the Fifty-sixth Congress, William McKinley being President of the United States and Joseph Ramsey, Jr., president of the Wabash Railroad, a Senator from the State of Pennsylvania and a Representative from the Pittsburg district introduced, by request, into their respective houses some sort of a bill or joint resolution. Couched in a few words, it provided for the revival of a bill by which Congress had once authorized the building of a railroad bridge across the Monongahela River into the city of Pittsburg. No attempt had been made by the original applicants for the privilege to avail themselves of it, and their permission had lapsed by limitation. Granted originally for the construction of a steam railroad bridge, a renewal of the right was now desired on behalf of a projected trolley line.

Trolley lines are everywhere and ever-ready, and resolutions in their behalf are a necessary part of current legislation. Trolley lines are more or less clamorous among the constituents of every

Congressman, and by resolutions of one sort or another they are usually appeased. Moreover, the introduction of a measure by request costs little. Not one joint Congressional resolution in a hundred passes; when one does pass it is rarely heard of again.

This particular measure, however, was peculiar; peculiar in the innocence of its wording and peculiar in the tremendous sting in its tail.

It is no exaggeration to say that there was not one chance in a thousand for it to get through both houses of Congress. The whirl, the confusion, and the rush of the closing of the session were all against it. Moreover, there are a dozen Senators and Representatives whose very business in the Congress of the United States is to defeat the objects sought under cover of precisely such bills—genuine Congressional sleuths who, while raising their voices occasionally in behalf of the people that send them to Washington, are sleeplessly vigilant in behalf of the friendly "interests" which they represent.

A single objection raised against the waif by any stray malcontent in either house—any member with a digestion temporarily disordered—would have been fatal; yet, with its purpose undreamed of by its legislative fathers, and in a crush in which a thousand well directed and fer-

vently urged measures always do fail, this tramp bill slipped successfully past every peril of the closing hours of the turbulent session. It passed; and its innocent words divided a railroad empire —the long, hard fight of the Wabash to get into Pittsburg was won.

The white light of publicity is supposed to burn upon all important legislation at Washington, and the appetite of the press for news of this sort approaches the ferocious. Yet here was a business calculated to shake the railroad world to its very centre, and loose its bitter dogs of war from the Atlantic seaboard to the wastes of the Missouri River, done so quietly that mention of it never crept into a Washington despatch. More singular still, it must be remembered that its very introduction had depended on the good offices of a Pennsylvania Senator and a Pittsburg Congressman, both of whom were guiltless of the remotest intention of helping out the Wabash in its uphill encounter with the Pennsylvania Railroad for a Pittsburg terminal.

A century hence, when the curious traveller asks to see a monument that commemorates our laboriously planned and jealously guarded protective policy he will, without doubt, be pointed to Pittsburg. Pittsburg is our traffic gold mine. When it is said that Pittsburg and its district originate

the largest freight tonnage of any city in this country, or for that matter in the world, the public mind grasps the statement fairly well and the result is some respect for Pittsburg; it was news to many when announced, but it was accepted calmly. There is, however, more than this to the statement. Pittsburg originates not only more freight tonnage than any one of our cities, but more than our three greatest cities, New York, Philadelphia, and Chicago combined.

A business man can digest even this extraordinary fact, but how can he keep clear-headed when told that this traffic in the Pittsburg district, taking no account of what merely passes through Pittsburg, reaches the stupendous total of 75,000,000 tons in a single year? Or, again, can he really grasp what is contained in the bare statement that the Pennsylvania Railroad east of Pittsburg handles 75,000 tons of freight daily for each mile of its main line, and that in one year the earnings of that portion of the system exceeded $150,000 a mile?

These figures are not in any sense news. They may be derived from official reports. But the public does not read railroad reports, and it is no reflection on its intelligence to say that it would not understand them if it did. Not even business men, in fact, understand the report of one railroad

quite so well as the executive officers of a competing line.

This showing affords an inkling of what Pittsburg and the Pennsylvania road mean in the railroad world; a suggestion of the prize that had long hung suspended before the Wabash eyes. Is it any wonder that George Gould, owning the Wabash road, determined to put $25,000,000 into an effort to secure a terminal that would open the doors of such a storehouse?

Let there be frankly conceded the worst that can be said—and harsh railroad things have been said of Mr. Gould; for example, that he is invading a territory where he does not expect to develop one dollar's worth of new traffic—yet it comes in the end to this: that, placed owner of the Wabash system, as he was, by the combinations going forward five years ago, if he had allowed himself to be bottled up at Toledo, at Detroit, or even at Buffalo, with Pittsburg in his grasp, he would not really have been quite so aggressive as big American railroad operators of stern necessity are.

It is hardly more than five years ago that it became apparent to the Gould interests that a Pittsburg terminal would become, in truth, a strategic necessity. When, in 1895, Joseph Ramsey, Jr., was made vice-president of the Wabash

its Eastern terminals were Toledo and Detroit. In the meantime the various combinations of the Pennsylvania Railroad and those of the Vanderbilt lines were taking shape. Every day emphasized the purpose of each railway power in the country to acquire feeders for itself and make impregnable a control that would take care of irresponsible competition. The Wabash could not at that time land freight even in Buffalo save over a hostile connection. Gradually it was being cut out of a feeder here and a feeder there until action did become imperative, and the Wabash was pushed to Buffalo. A Buffalo terminal was a bold move; but with Buffalo once made the Gould people looked again from Toledo for new conquests, and Pittsburg, like a mirage thrown suddenly into the railroad sky, loomed upon the Wabash horizon.

The railway world of the United States was in that moment at the height of an activity such as it had never known and never again within centuries can know. Territory was being preempted that never again will be open to a railroad settler; combinations were daily being made that will govern a thousand years from now, and leases were being executed that will not terminate within thirty generations of men. What may at that time happen to these coveted properties can

scarcely be expected to interest the powers of the present generation. But five years ago it meant that the man who wanted control of a road or needed a railroad footing in a contiguous territory must act, or for nine hundred and ninety-nine years thereafter hold his peace; Gould decided to enter Pittsburg.

He had on his operating staff a man fitted for the difficult venture. Joseph Ramsey, Jr., had been for three years vice-president and general manager of the Wabash. He had entered the engineering corps of the Pan Handle road thirty years earlier. Within a year thereafter he had been transferred to the Dresden cut-off, and while still hardly more than a boy had, as assistant engineer, located the Bell's Gap road, a circuitous route winding about within the very heart of the Alleghany Mountains. His movements were as rapid as his promotions. A Pittsburger born and brought up, the Alleghanies were this man's birthright, and his early life was spent as engineer, superintendent, chief engineer, from division to division and from road to road, in and out of and around Pittsburg. At thirty-three, and a general manager, he had mastered as engineer and operator every problem put before him in mountain railroading, and he knew his mountains in the Pittsburg district as well as he knew his

trigonometry. Turning to Ohio, his activities as the chief engineer, the general manager, and the operating vice-president of various roads took him from end to end of the State, and familiarized him thoroughly with the territory from which he was destined ten years later to lead his greatest undertaking: 1898 brought him face to face with it.

From any point of view the problem of getting a railroad into Pittsburg is a staggering one. The physical obstacles alone are overwhelming; but these difficulties are incalculably increased by the extraordinary intrenchment of the Pennsylvania road in its own peculiar stronghold. Financially, physically, and politically, the principal fortress of the great road is well-nigh unassailable. Instinctively alert, and representing, as they always have represented, the highest astuteness in railway management, the Pennsylvania people had closed avenue after avenue toward their centre. The absorption of small lines that might offer temptation to an invader had been carried on until railroad maps were changed faster than new ones could be printed. Nevertheless, the Wabash forces organized for attack.

From Toledo a single loophole left unguarded made possible a long march toward the coveted territory. In leaving Toledo eastbound travellers on the limited trains of the Lake Shore

road see for some distance on the right a single-track railroad often mistaken for the Nickel Plate. It is a modest coal road known as the Wheeling and Lake Erie, and it runs across Ohio from Toledo quite to the eastern boundary of the State. The Wheeling and Lake Erie was owned by Cleveland people—Myron T. Herrick and his friends—and was then for sale. A gap of some sixty miles from Jewett, Ohio, would extend that meandering and very quiet coal road to Pittsburg, and George Gould determined to buy the Wheeling and Lake Erie.

It is said that the property had once been offered to the Pennsylvania people. Whether true or not, nothing could better illustrate the sharp, fast moves of the game then already on than the story of the purchase of the Wheeling and Lake Erie. So alive were all parties at interest in the matter, the besiegers and the besieged, that in the short interval between the time Mr. Gould determined to buy the road and the consummation of his purchase he was compelled to pay more for a controlling interest in the stock than the whole road and all of its securities had originally been offered for. But with the purchase of the Wheeling and Lake Erie the mask, so far as ultimate intentions are concerned, was thrown off and war began.

No one will say that it has ever been other than a gentlemen's fight. The conditions of the invasion were well understood, and quarter was neither asked nor given; but the diplomacy, the fine moving, the gloving of the hand, and the iron shock of all the secret complications of the contest cannot be and never will be written: they belong to the stories that never are told. The State of Pennsylvania is celebrated not alone as the home of one of the greatest railroads in the world but as the State with the most astonishing railroad laws, this being one of them: the directors of a railroad may in session "adopt," without restriction, any route in the State of which they choose to make a survey, and, without doing a dollar's worth of work, they may hold it absolutely for a period of two years. Their record of their plans is their own privileged secret. They may meet in publicity or in seclusion and "adopt" any part of the Alleghanies they fancy, but they cannot be dislodged within two years under any circumstances, and, should they care to proceed, not then.

This peculiar statute makes an attempt to enter Pennsylvania with a new railroad somewhat confusing, especially if there be powerful interests to oppose. However, the rule that works one way works the other, and the moves between Mr.

Cassatt's forces and Mr. Gould's became those of experts at chess, with the Pennsylvania Railroad at times most unexpectedly calling check and the Wabash retorting with counter-check.

Naturally, that which makes a leadership effective in a battle under cover such as the Wabash was compelled to wage is a thorough acquaintance with all the factors in the contest. Ramsey, Gould's chief in the struggle, has been called, as Grant was called, a bulldog, and it is true that the two men have, in common with Americans of their peculiarly emotionless type, those quiet and impassive qualities of persistence that go to make up really dangerous antagonists. To men such as these an obstacle interposed means only that it is something to be crawled over, or burrowed under, or turned by the right flank or turned by the left, and as Grant hurled his men against the Wilderness lines so Ramsey hurled the Gould millions against the Pittsburg defences. In that remarkable city alone five million dollars were spent in acquiring terminal property, and those sixty miles of Jewett track that Ramsey built are sown from end to end with gold. A single tunnel called for a million dollars; a second one for nearly as much. Within a distance of twenty miles there are eight large tunnels, several concrete arches with fifty-feet spans and fifty

heavy fills, one of them 3,500 feet long, built of 1,000,000 cubic yards of earth. In all the United States there is nothing in railroads like this sixty-mile track. When railroad men are told that James W. Patterson, Ramsey's chief engineer, has crossed the Ohio Valley with a maximum grade of seven-tenths per cent. and a maximum curvature of three degrees, they are first to express admiration for his achievement; and through the most adverse topography and this low rate of the curves he has managed to preserve sixty-one per cent. of straight track. To be of value to its builders the line needed to be equipped for high tonnage. The very necessities called for a light-grade road with easy curves, and the engineers made their surveys to fit the requirements.

A comparison with standard lines in the same territory will show how in 1903 railroad construction has advanced over the best construction of earlier years. The Pan Handle leaving the Ohio River at Steubenville for Pittsburg, as the Wabash extension leaves it at Mingo, has two prominent summits on its line as against one on the Wabash. The heaviest grade on the Wabash is less than thirty-seven feet to the mile, against something like sixty in the first construction of the Pan Handle. In all, these forty miles of Gould track have but fifty-six curves, and so

straight has the line been made that one may stand at the west end of the first Ohio tunnel and look through it across the trestles, over the Mingo bridge and through the tunnel in the West Virginia hill. Country roads were abandoned and new ones built by the engineers; viaducts were thrown across farms and mountain streams torn from their courses to make the Jewett track. At the foot of Chapel Hill Mr. Patterson has provided a fifty-feet span arch with a "barrel" 180 feet long containing the largest single mass of concrete in the form of an arch in the world. For miles through the mountains the track springs from height to height over enormous fills that often exceed a hundred feet in depth.

It will not be supposed that these results have been reached without strenuous effort nor without occasional subtle entanglement for the Wabash constructionists. But they never faltered. Out-manœuvred at one point, they sought another; checked at a gap, they bored a mountain. The most unexpected natural obstacles interposed themselves even when foresight had provided for those of human agency. Underneath the million-dollar Green-tree tunnel a coal vein, without the knowledge of the owners of the land, had been stripped. One night a section of the tunnel floor dropped eighteen inches. It was

not that it cost forty thousand dollars to make good the settling; what hurt most was that it took six months' time. Bridges were called for till steel mills threw up their hands. There are on this short line—without numbering either the great Mingo bridge across the Ohio with a seven-hundred-foot cantilever span or the tremendous Monongahela cantilever at Pittsburg — more bridges than there are miles of track. The Monongahela bridge, scene of a tragic accident during its building, is in itself most unusual. Like the Mingo bridge it provides for a double track and is built with thirty-two feet between truss centres. It stands on a one-per-cent. grade, and rises, at the low end, a clear seventy feet above full pool in the Monongahela River. The weight of this singular and enormous structure is above 7,000 tons. A mate to it, indeed, is not to be found on this side the ocean. For its only bigger brother one must go to Queensferry, Scotland, where years ago the North British Railway Company flung across the estuary of the Forth River the world-famed cantilevers that are united in spans 1,710 feet long; but even this unexampled undertaking leaves the Wabash bridge, at 812 feet in a clear span from centre to centre of towers, the second longest cantilever bridge in the world; and this is the bridge whose very per-

mission to be, slipped past the Pennsylvania watchdogs in Congress as modestly as a mouse could slip through a hole in a barn floor.

In a railroad fight, however, there is no fatalism, and it should not be inferred that if the Wabash had not won at that particular time at Washington the fight would not have been fought out again there or elsewhere. The Washington blow, though a serious one to the defenders, left them undaunted, and in the Pittsburg councils they repeatedly prevented the passage of an ordinance giving to the Wabash permission to enter the city. While the battle raged in the city councils the Wabash people went ahead with their big Monongahela bridge, which without an ordinance to cross Pittsburg streets with their elevated structure must have proved valueless.

Pittsburg looked on amazed at their apparent recklessness. Hostile city officials sought to enjoin Joseph Ramsey and his cohorts from wasting their money on a structure across the river when they could never get into the town; but in court the Wabash counsel pleaded the sovereign authority of Congress for its license to cross a navigable stream, and the court decided an injunction could not issue. Appealed to the Supreme Court, the decision in the case below was reversed, but work had been going steadily

on and the city of Pittsburg itself had been meantime waking up. The tide of unprecedented prosperity which spread over the United States and reached its climax in 1901–02 swept even so highly organized and perfectly disciplined a railroad system as the Pennsylvania for a moment completely off its feet. Traffic in ever-increasing volume overpowered its heavy equipment, and, worst of all, congested its freight yards.

Pittsburg became an absolute storm centre, and loaded cars at the Pittsburg yards could not be got in or out; the situation became a traffic tragedy, resulting in the most strenuous personal effort on the part of high executive officials of the great road to bring order out of the terminal chaos at Pittsburg. This freight blockade came at a time when business men were least willing to bear it. To plead that no other road under similar difficulties could do half so well availed nothing. The Wabash, gently fanning the flame of local discontent, appealed to the business interests of Pittsburg to bring competition into the city. The Wabash issue was made of a sudden a fierce political one, and Mr. Ramsey, who probably never for a moment had doubted that, when he had once clearly demonstrated to a suspicious public that the Wabash was making a good-faith attempt to bring a compet-

ing line into the town, public opinion itself would force the passage of an enabling ordinance, found himself again in luck. For two years the fight had raged with greater or less fury among the aldermen; at last they began to waver. Where the Wabash had had its enemies it began to find friends, and the adverse Supreme Court decision had hardly cooled before a change in the Pittsburg councils' complexion gave the Wabash its ordinance so long and stubbornly held up, and the last legislative bridge was crossed.

It was by no means the first time that encouragement had been extended to the invaders by large Pittsburg interests. In the incipiency of the fray substantial promises of business had been made by various Pittsburg shippers. The very moment the news of the Gould plans to enter the city became public, rumor asserted that the Carnegie Steel Company had already contracted to give the Wabash twenty-five per cent. of its Western tonnage. The assertion has repeatedly been made and has been repeatedly denied, but it is definitely known that such a contract does exist, though perhaps its importance in the public mind is somewhat exaggerated. It has been averred that the interests in control of United States Steel will not abide by such an agreement; though it is difficult to see how the most hostile

management could avoid it after Gould has expended $25,000,000 to make good his end of the compact—courts are somewhat jealous in guarding questions of consideration. Again, it is hardly safe to say who really is in control of United States Steel; but aside from all question of steel control, the strategy of a game of this size is infinitely bigger. It must be considered that if no contract existed, on the day that Mr. Gould opens the doors of his freight houses in Pittsburg for business there lie behind them fifteen thousand miles of his own rails, and that the Wabash will call for a reasonable proportion of Pittsburg tonnage and command it. A disturbance of rates in the Pittsburg district is not calmly to be thought of in the railroad world; it would disturb Holland more than a tidal wave. Naturally the Pennsylvania Railroad continues to tie up every possible source of business, but when the Wabash connects with the Union Railway—the Carnegie local line to various industries in the district—it alone will open up a share of traffic that amounts, in what were the Carnegie industries, to 16,000,000 tons annually, while the other industries the local line reaches contribute enough business to swell the figures to 40,000,000 tons.

With the Wabash in the Pittsburg territory the railroad control of all this enormous business

and the division of richest railroad territory in the United States becomes triangular. The Vanderbilts, the Pennsylvania, and George Gould now dominate and will dominate in New York, Pennsylvania, Delaware, Maryland, Ohio, and West Virginia, with powerful arms reaching to the Mississippi Valley and north and east into New England. It may mean the closing of the map for centuries; certainly in our day the present control is likely to remain undisturbed.

THE GOULD LINES

THE GOULD LINES

If there has been during the opening years of the present century a sensitive spot anywhere in the railroad situation of the United States, it may properly be termed the Gould lines.

Not a deep study of railroad affairs is needed to explain why. The Gould lines are young, vigorous, and aggressive. The head of the Gould lines is said to work much of the time with his coat off; he is young himself and not afraid of draughts. His roads, then, may be said to take their cue from their owner; in the railway world the Gould lines work in their shirt sleeves, and every once in a while the question bobs up, What will they do next?

Those that picture the railroad magnate a man of elegant leisure or of luxurious ease should follow the owner of the Gould lines through a week's work at his New York desk, or note the size of the bag of papers he takes every Friday night to his country home, or count the telegrams that he throws to an operator on each Monday morning for transmission at the various

operating headquarters on his fifteen thousand miles of railroad. Every road in his system he knows intimately; steel rails were his business cradle; he began railway management when he was fifteen years old.

The hive of the Gould lines' activity is the old building on lower Broadway that has housed the Western Union for so many years. Number 195 Broadway may not stand for much among modern office buildings, but it stands for a great deal in the railway world, and, to follow the figure of the hive, it gives at times uneasy moments to railway neighbors, particularly when they find Gould bees swarming in their back yards. What, then, are the Gould lines? And what do they stand for?

No railway combination in the United States is so loaded with possibilities. A glance at its map shows its stronghold; it lies west of the Mississippi. In the corn belt the Wabash extends as far north as Des Moines and Council Bluffs in Iowa. The Missouri Pacific, though it pushes into only one corner of Nebraska, pushes into the best corner; and in Kansas it doubles and branches from end to end of the State until its map becomes, in a railway sense, paramount. To the Eastern public the Gould lines are hardly known. Even in Chicago they are known only

at a distance; it is when one reaches St. Louis that the Gould lines are felt; in St. Louis they are very distinctly in the railway air. The Wabash shows strength in Illinois, and the Missouri Pacific meets it at the Mississippi with almost a dominant power in Missouri. From St. Louis, Gould lines run everywhere south and west. They thread the valleys of Arkansas, throw arms like rivers from side to side of the State of Louisiana, and spread in a teeming delta far out upon the plateaus of Texas. They lie under the snows of the forests of Michigan and they skirt the parching heat of the Staked Plain. The Missouri Pacific stretching across Kansas to Colorado meets the Denver and Rio Grande at Pueblo, and crossing the Rockies the Gould lines await the products of the irrigated valleys and climb high into the mining camps of Colorado and Utah.

From even so inadequate a sketch of their Western strength some idea may be had of what comes behind George Gould when he brings his lines into Pittsburg, for example. No other railroad power in the United States that looks to the Atlantic seaboard has, up to this time, crossed the watershed of the Rockies; but George Gould is already at the Great Salt Lake, and water dripping from his rails finds its way into the Gulf

of California. He is at Leadville above the Arkansas, and his roads track the big river clear to its mouth and follow its waters to New Orleans. From Omaha he tabs the Missouri River every traffic mile of the way till it mingles with the Mississippi; and the Mississippi, all the way from Keokuk in Iowa to its mouth, is hedged with Gould roads.

This is what gives the backing to the Gould system. Its mileage does not mean the densest traffic, for a division between New York and Philadelphia may stand for more business than a whole stretch of track across the State of Texas. But the history of the Eastern systems of railroads is made; that of the Gould roads is in the making. The territory that the Eastern roads cover is developed; the stronghold of the Gould lines is in its infancy. What, in another generation and in the hands of an equally able successor, may the Gould lines mean, when to-day in farthest Texas they strike, with the Texas and Pacific, the waters of the Rio Grande at El Paso, find a powerful Gulf outlet at Galveston, and spreading thence north and east, not in a single track but in doublings and battalions of tracks, find a harbor at Buffalo and a terminal at Pittsburg?

Nor is the Western end of their territory at present the most distinctive. As far as trunk

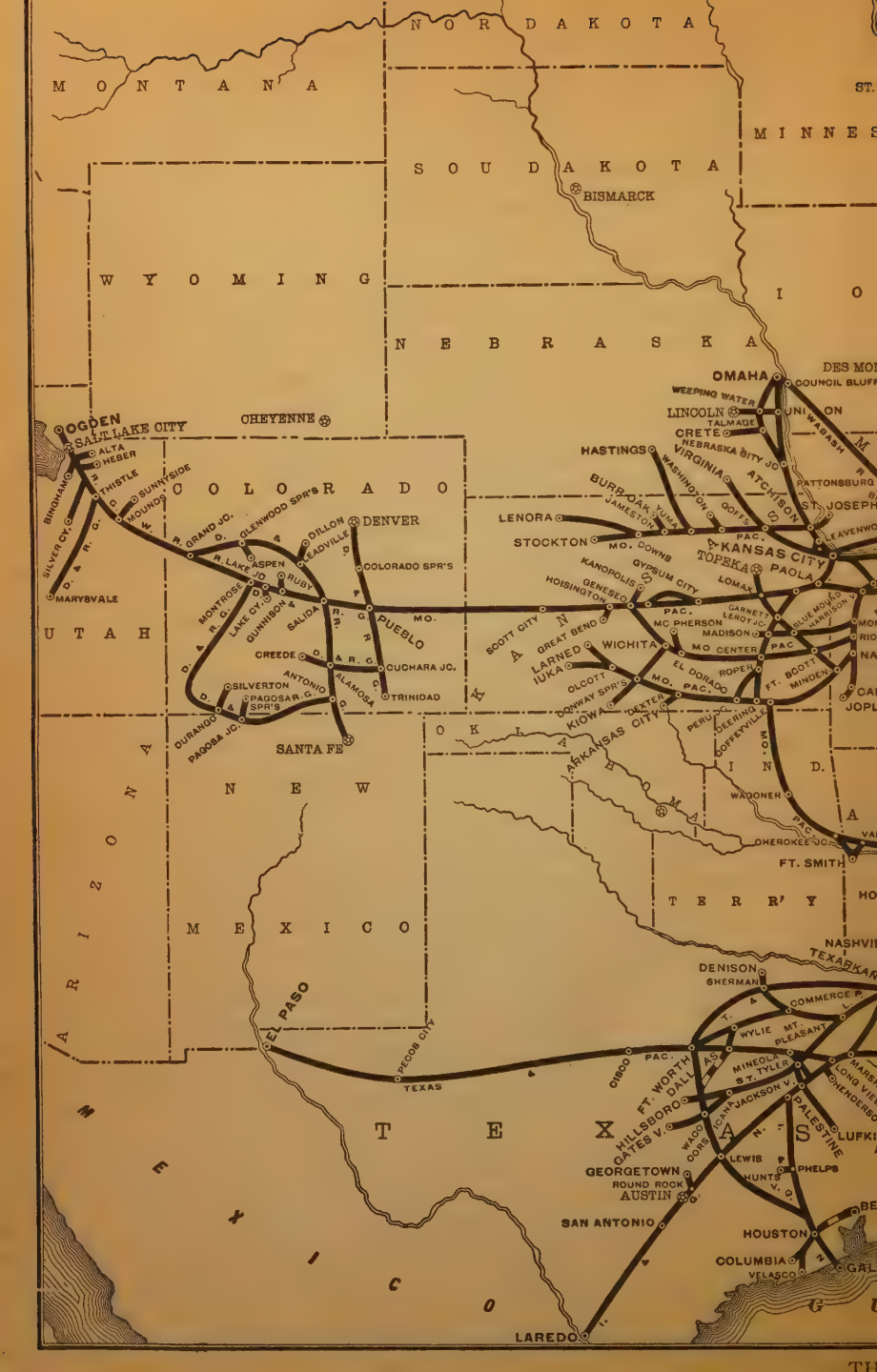
lines from the Mississippi Valley to the Atlantic seaboard are concerned the situation is so in hand, the community of interests between Mr. Morgan, the Vanderbilts, and the Pennsylvania so perfect, and the territory so covered, that new ventures in that field are to-day, with one exception, inconceivable.

The exception is the Gould lines. Far down in the western extremity of Maryland and among the northern passes of the Alleghanies in West Virginia little lines may be seen breaking out like mild eruptions, so to say, on the railway map. They spring up in red streaks and patches after morning telegrams in the New York papers noting changes in control, sales of short and unimportant lines in that territory, and in construction news concerning the leasing of coal lands. The despatches are fugitive and scattered, but they have a common significance; they stand for Gould blazing his trail to the Atlantic seaboard. From Pittsburg he is filling in the gaps that will put the Wabash into Baltimore. No cheap railroad there will serve; such a line, like the Pittsburg extension, must be of the best twentieth-century railroad construction, for the competition he then pits himself against is like the white heat of steel and as pitiless. Leaving out possibilities not yet to be discussed below the

fifth floor of 195 Broadway—consider where this definitely, and almost to-day, puts the Gould lines: At the Atlantic seaboard with a Baltimore terminal; at the Canadian boundary with a Buffalo terminal; at the traffic heart of the United States in Pittsburg; in the Lake Superior country with the Toledo and Ann Arbor, where Gould car-ferries await grain from the valley of the Red River of the North and command traffic in the iron and copper countries; then in one tremendous sweep past New Orleans to Galveston on the Gulf of Mexico; still farther to the very southernmost terminal in the United States, Laredo, Tex.; and from there to within striking distance, at El Paso in Texas and at Ogden in Utah, of the Pacific Ocean.

Certainly, for those that cherish the thought of a day that will see one transcontinental trunk line, unbroken in control, from the Atlantic Ocean to the Pacific, here is material for dreams. On the other hand, the timorous, who look with alarm on the prospect of one-man control in American railroads, will find compensation in the fact that for Mr. Gould working-days cannot possibly grow forty-eight hours long, and that Mr. Rockefeller, his partner, is advanced in years.

But the Gould lines to-day stand actually for so much that speculation as to their future may



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HOISINGTON
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FT. SMITH
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PECOS CITY
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OGDEN
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THISTLE
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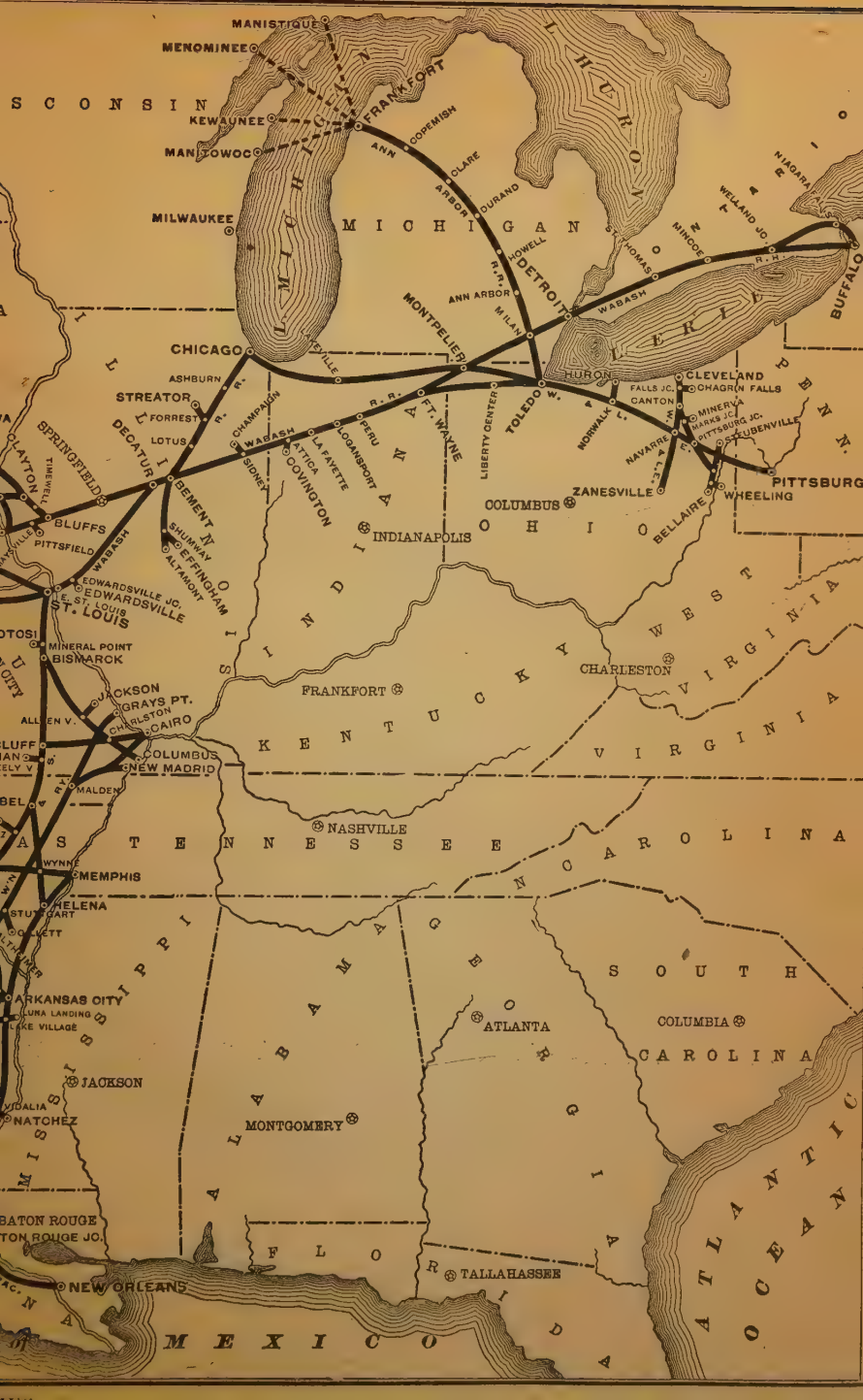
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CLEVELAND
CHAGRIN FALLS
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PITTSBURG JC.
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WHEELING
PITTSBURG
BELLAIRE
COLUMBUS
INDIANAPOLIS
OHIO
INDIANA
KENTUCKY
WEST VIRGINIA
VIRGINIA
FRANKFORT
CHARLESTON

be spared. They stand for a line from Buffalo to Kansas City and from Omaha to New Orleans. They stand for a line from St. Louis to Ogden and from Pittsburg to El Paso. They stand for a line, with the Mexican National, from Chicago to the City of Mexico—and that the shortest line. They stand for a line from Denver to Pueblo, across Kansas, through the Indian Territory, with a wholly rebuilt, low-grade line down the Arkansas River and Valley to the Gulf ports. Gould lines are so thick from St. Louis to the mouth of the Mississippi that, where in the wisdom of rural legislators lines in competitive territory may not be officered by the same people, it is necessary to call in outside talent to man the executive staffs, and to the natives the sanguinary railroad spectacle is presented of Mr. Edwin Gould heading one line while Mr. George Gould manages the destinies of a fierce competitor.

Here, then, is a system of railways with traffic possibilities as big almost as the country itself. It is not ideal as to composition; no system that has been built up line by line as opportunity of purchase or lease offered can be. It certainly is in many portions far from anyone's ideal as to physical condition; these are the accidents of empire-building without unlimited resources. What should be marked is that the later addi-

tions to the Gould system are of a class wholly different from the older lines. In order to get something he does need in the way of a link or a feeder, a railroad operator in building up often finds it necessary to buy something he does not in the least need. There are always branches in a railroad group that are hard to fit in anywhere as earners, and on which it seems like letting blood to spend money, and though with every tide of business prosperity in the country the railroads all get a lift, the day for picking up good things on the railroad bargain counter has largely gone by, and the big operators to-day are busy dusting up and polishing their antiques. What they need now is usually something that cannot be bought—lines to round out adequately their present holdings and to increase their earning power. Such needs are too definite to be served by picking up stray pieces of track, could they be had. The time has come when for these purposes links or extensions must be built, and any railroad built to-day must be built within certain definite limits as to grades and curves, or it cannot earn money. The example of what George Gould has done in modern construction in getting into Pittsburg has been widely discussed. In Pittsburg last year his chief of construction checked out $12,000,000 of Gould

money, placed to his private credit, so fast that he felt a personal shock in the celerity of the operation. While this was going on, Gould funds were being poured out in a stream west of the Mississippi. To avoid the terminal crush at St. Louis, Gould is completing from East St. Louis a new line to the Gulf with maximum grades of three-tenths per cent., easy curves, and an eighty-five-pound rail. This means St. Louis to New Orleans and Galveston, and with the strongest line in the field.

Down the valley of the Arkansas, millions of dollars have been spent in rebuilding completely the track in the Little Rock and Fort Smith territory, making it low-grade and equipping it for the exactions of heavy tonnage to strengthen the big links from the Rockies to the Gulf. From the Ozarks in Missouri, Mr. Gould is building down the White River another low-grade line that will not only supply the shortest line from Kansas City and Missouri River points to Memphis and New Orleans but will open up a new territory described as "magnificent."

In the building up of any great system of railways ambition may to a certain point be the chief factor; beyond that it becomes self-preservation. The acquiring of additional lines is in the end a necessity to provide outlets for traffic originating

in one's own territory or to secure feeders that will supply material needed by the territory's industries. Railroad operators are forced at times to take over competing lines that assume the attitude of blackmailers; roads have been built with precisely such ends in view. In this way any system is liable to acquire more or less dead wood, the only salvation for such investments lying in the ever-growing needs of the country for transportation facilities, so that ultimately the least useful division takes its place acceptably in the activities of the system.

In this way, too, it is a fact, and at times a serious one, that there comes about in railroad consolidation a wasteful competition between different lines belonging to the same interests. The view here taken assumes nothing more than that public interests require not only reasonable rates but stable rates, and when, whether through secret rebates or the reduction of an open tariff to a point below a legitimate operating profit, a road cannot make money, it is in the end the public that suffers.

Of equal disadvantage to public interests is the policy sometimes followed by the traffic manager of a small line in a system, who, in order to make a showing for his own road, so refuses to interchange traffic with foreign lines as to be in a state of war with his neighbors. He may, for instance,

refuse to let traffic go off his line save by the longest way, making prohibitive rates the short way, thus delaying traffic movement if nothing worse. He may in this manner make the whole system of which he is a small part suffer even in the interchange of traffic between component lines. Few systems have not felt the waste and disadvantage caused by the tendency of each manager to consult his own interests and let the system look out for itself. A system so situated becomes a house divided against itself; stockholders suffer in earnings and shippers' interests suffer through neglect, because every economy in operating expense and in time tends ultimately to benefit the public.

To meet this difficulty and to insure internal harmony in the affairs of the different American railroad combinations a new American railroad official has been called into being. He is so new that as yet no quite satisfactory title has been found for him, but such men may be termed chief traffic officers; in this capacity Mr. Bird serves the Gould lines, Mr. Darius Miller, the Hill lines, Mr. Stubbs, the Harriman lines. Their official titles may vary somewhat; Mr. Bird is vice-president of the Gould lines, Mr. Miller is vice-president of the Burlington road, and Mr. Stubbs is traffic director of the Harriman lines.

Heading the departments of traffic, they may all be termed traffic directors. As to their authority, they are actually traffic presidents, in that their powers, as arbiters of traffic between the various lines in their combinations as well as over all, are plenary. In the judicial aspect of their railroad systems they are traffic supreme courts, umpires from whose word there lies practically no appeal, or from whom an appeal if lodged must lie directly with Mr. Gould, Mr. Harriman, or Mr. Hill.

The authority of a man so placed is of extraordinary scope. Upon his dictates depends the entire income of his system. Nor is his system the only party with vital interests lodged in his hands, for it comes almost as a shock to reflect that to-day—if we include the traffic officers of the Santa Fe and of the Rock Island lines—it may be said that in the whole vast territory west of the Missouri River the making and unmaking of every rate is in the hands of five men. Considered rightly, however, rather than being an occasion for alarm, this is a substantial guarantee to the shipping interests of that territory that not only reasonable but stable rates will prevail. With this nearest approach to one-man power in trans-Missouri territory that will probably be seen in this generation there still remains so great a diver-

sity of interests between the roads themselves, as well as the territories they serve, that very keen though conservative and businesslike competition must long continue to exist as it does to-day; and people of Washington and Oregon will know that they have in Mr. Hill a vigilant railroad operator to look out for their traffic development, while Southern California will realize that the Santa Fe and the Gould and the Harriman lines will not let them suffer in the struggle to secure their share of national commerce. Shippers under such a congress of traffic chiefs are safer than they would be under twenty-five traffic managers operating for periods by means of secret manipulations and breaking at other times into open rate wars.

In the work of these traffic officers, lie requirements of the highest intelligence, the widest acquaintance with public need, and the broadest views on questions of transportation and the development of local industries. To the traffic chief his system must look for elimination of waste, whether of time in the best routing of traffic or of money in unnecessary transfers and rehandling. He must determine when a rate reduction becomes profitable and when an advance becomes necessary. Before him must be adjusted the rival contentions of subordinate managers in his own railway family, and he must keep his

group of roads as a unit on terms of fair dealing with foreign roads.

The results already shown in this idea of unifying traffic management are material. In the matter of interchange of loaded cars alone, between connecting lines of a system, the new plan of management has more than justified itself. When a road in a system allows its loaded cars to go unreservedly to other roads under the same ownership the record is usually that they go to a "graveyard." On the Gould lines the Missouri Pacific, under the old traffic conditions, unloaded its eastbound cars as a measure of self-defence at its St. Louis terminal and the Wabash reloaded the through freight there into its own cars. This entailed an expense of $2 on every car of freight rehandled. It is frequently assumed that because such a charge is absorbed by the railways this costs the shipper nothing; this is not true, but of greater consequence is the delay that the rehandling involves at overcrowded terminals. This and like wastes of time, labor, and money it is the business of a traffic chief to do away with.

To take an example, not because especially noteworthy in magnitude or novelty but because it is explicit in the interchange of traffic on one railway system, the two roads last named interchanged on the twelfth of November, 1903, 1,277

loaded cars. The transferring of the freight being done away with, those 1,277 loads wholly escaped the deadly delays of terminal warehouse handling and were sent by a belt line as originally loaded from the one road to the other. Nor did the car equipment of either road suffer in the operation. By the simple clearing-house expedient of compelling each road to make good every day its debit balance of cars, loaded or empty, the equipment of each is kept at all times unimpaired. If the Wabash receives a thousand loaded cars from the Missouri Pacific it must surrender that day in return one thousand loads or empties. On the day instanced the transfer of 1,277 cars between only two lines of one system saved an unnecessary reloading expense of $2,554. Applied to one day's freight transfers over all the United States the sum involved would be enormous; but this is only one of many ways in which a director of traffic makes himself felt. He sometimes finds one of his small lines routing freight in a roundabout and slow way in order to get the whole haul; but a chief traffic officer with more judgment requires that freight shall go by the quickest route and, in not unknown instances, even when this means that a portion of the haul must be given to a foreign line. Prompt service is put first.

Such instances afford a glimpse of a broader viewpoint in railway management—a viewpoint better in the end for stockholders and owners as well as for public interests—that is making itself everywhere felt in railway affairs in this country. The evolution of good railway management has seemed slow and has been attended by many abuses—though not more than have accompanied the development of any great modern institution, industrial or political. To-day there is less abuse in railway management than there has been in the history of railroading, and the elimination of much of it has been made possible only by making the systems bigger as the country grows bigger. Railway men realise that their properties are always at the mercy of the people. Public interests may always be safeguarded at Washington by intelligent Federal legislation; all that railroad men ask is that it be intelligent. At present the traffic officer who makes the rates finds himself hampered by enactments, State and Federal, so contradictory that they make it difficult to do justice to any interest.

It is not always, it should be marked, the raising of a rate that makes trouble; the lowering of one is frequently productive, in disturbing the delicate adjustment of traffic movement, of no end of trouble. Shippers, however, are getting

closer to railways in reconciling differences of opinion between them; they are learning that nothing is less satisfactory than a traffic lawsuit. Between the man that sells transportation and the man that buys there will naturally arise differences in view. The railways in the Northwest at one time reduced the seaboard rates on grain till Northwestern millers saw the ruin of their flour business impending. They determined to fight for their existence as millers and appealed to a great traffic expert on the Vanderbilt lines, Grammer, of the Lake Shore, to help them get up their case for the Interstate Commerce Commission. Captain Grammer heard attentively and answered with a suggestion. He instanced the famous hay cases before the Commission, the unending wrangle and delay, and said: "Why not prepare your case and appeal with it not to a Federal tribunal but directly to your railroads themselves? And I will help you to draw your briefs." They saw the advice was good and took it, and were rewarded with a satisfactory adjustment of their difficulties.

The matter, too, of raising a traffic rate, even when circumstances equitably and justly call for such action, has become well-nigh impracticable, and the Interstate Commerce Commission has come to believe that the sole reason for its exist-

ence is to lower rates. Under such conditions a traffic officer will not undertake the responsibility of lowering a rate, even when he feels it might safely be done, because he knows that once put down—to relieve a situation or develop a new industry—he should never be able to restore it.

In the face of such conditions everything that railways buy, whether of labour or equipment, has within five years materially increased in cost, while rates have not kept pace with the advances. All ingenuity in traffic management is thus reduced to economy in distributing and collecting commodity movement.

However, the very difficulties with which railways are to-day beset serve, it would appear, to bring out capability, ingenuity, and resource, and in all the activities of the every-day movement to these ends the Gould lines, in their shirt-sleeves, are markedly busy.

THE ROCK ISLAND SYSTEM

THE ROCK ISLAND SYSTEM

When the United States is reproached for shutting out foreign trade with a tariff wall, protectionists reply that, since the country contains in itself all natural resources, it needs no foreign trade. Whatever may be thought of the argument it must be conceded that a nation so situated is uncommonly lucky.

The Rock Island System, including, as it does, the Chicago and Eastern Illinois Road and the 'Frisco System, may be said to constitute with its territory a railroad principality, and one which actually does somewhat approach the industrial independence claimed for the nation.

The Rock Island, for instance, serves more towns of 25,000 people than any other Western road, and this gives it an urban standing. It might easily pose, too, as an agricultural road. A road strong in a wheat belt is said to be well intrenched. But what shall be said of a road whose wheat belt is bounded on the north by Canada, on the south by Mexico, on the west by the Rocky Mountains, and on the east by Ohio?

In the United States lies a pretty strictly defined corn belt. It is known as one of the richest agricultural regions in the world. Every railroad within the corn belt is rich, and the Rock Island lines are in the heart of it. That group of railroads in the Middle Northwest known before recent consolidations as the Granger lines has long been uniformly prosperous; but to-day, of all that group, only the Rock Island is able to carry export corn and wheat either to the Gulf over its own rails, or to the Atlantic seaboard through its Chicago gateway; it is at Chicago and within striking distance of Galveston. A third field product of primary importance remains —cotton; and the Rock Island is a cotton road. Fourteen States share in the production of this crop, which ranks second among all of our agricultural resources. Of these States, nine are served by the Rock Island lines.

What is still more unusual, one traffic territory served by the Rock Island, and somewhat vaguely termed the new Southwest, depends neither on corn, nor wheat, nor cotton alone. It enjoys a climate and a soil so patient of all of these crops that the farmer may plant, indifferently, which he pleases: cotton, or corn, or wheat.

The strength of a road drawing its traffic from all of our great agricultural districts is obvious.

Railroads of the farther Northwest depend on a wheat crop. But the Rock Island may view with less alarm the failure of a wheat crop, or of any one of our three greatest crops, because it still has the other two to depend on.

Last year seventy per cent. of the total grain crop of the country was raised in Rock Island System States. Sixty per cent., or 2,000,000 carloads, was raised in eleven States shipping largely by Rock Island lines. Fifty-five per cent. was raised west of the Mississippi River.

The Rock Island brings cattle from the farms and ranges of its own territory to the packing centres of the country, reaching all of them, and when it markets the cotton of its Southern farmer it brings to him his meat grown and packed on its own lines. This very packing-house product is crated and boxed in wood cut on Rock Island lines and carried north by the Rock Island. The system reaches the only considerable timber supply, save that on the Pacific Coast, now left in the United States. It penetrates not alone the Southern pine districts, but reaches the magnificent hardwood reserves of the Southwest, including the oak of Arkansas and the walnut of the Indian Territory. Texas does not pose as a timber country, yet the timber lands of this State cover an area larger than the State of Indiana.

In Alabama the Rock Island is at Birmingham, which means a terminal in an American iron and steel district second only to Pittsburg. As to precious metals, Rock Island lines are in Colorado, and they reach the smelters of Denver, Pueblo, Omaha, Kansas City, and El Paso. In lead the Rock Island is even more fortunate, for, with its 'Frisco System, it is, in the Joplin, Mo., district, paramount.

These are certainly claims to distinction, but they do not exhaust the Rock Island list. It not only reaches and supplies all great manufacturing centres of the Middle West with raw material, but it distributes their wares over 15,000 miles of railroad in consuming territory. At Moline and at Rock Island, Ill., are manufactories of agricultural implements among the most extensive in the country; they are very particularly Rock Island System industries. Kansas City, on the other hand, is the greatest distributing centre for agricultural implements in the whole world, and it is a principal terminal of both the big roads of the Rock Island System. In the southwestern part of Missouri and the northwestern part of Arkansas lies a region especially favoured by Providence in the temper of its soil and climate. It is known as the Ozark Plateau. Fruit should not ordinarily be expected,

outside California, to interest a large railroad system. But Missouri is the home of the big, red apple, and of these it supplies thousands of car-loads to the Rock Island. Niagara County, N. Y., boasts 924,086 apple-trees, and in the whole United States there is no record to approach this except in Washington County, Ark., where there were at the same time—1900—1,555,000 apple-trees; and Washington County has planted half a million apple-trees since then. The lesser fruits figure more in the traffic of the express companies, but peaches from the Ozark Plateau supply more than one thousand cars of freight every year to this railroad. The modest strawberry reddens in the winter sun at the southernmost corner of this delightful district. Beginning there, the Rock Island picks it up as the season advances, all the way up the line for the northern markets, and, incredible as it may seem, the Ozark strawberry, in addition to an enormous express business, supplies annually hundreds of carloads as freight.

A last natural product vital to the prosperity of an American railroad remains, and to its abundance of riches the Rock Island adds a wealth of coal territory which, in extent and distribution, is unusual. One of its new lines, the Chicago and Eastern Illinois, is distinctively a coal road, and

when it is considered that the coal fields of Colorado, Kansas, Missouri, the Indian Territory, and Alabama are all reached by the Rock Island, a strong position in coal resources will be granted it.

Considered, then, as a combination of railroads joined into one system for industrial independence, the Rock Island lines present a front that is formidable. A traffic pre-eminence can hardly be denied to so considerable a factor among Western railroads when once its plans are realised. It is to-day that these are being shaped. The Rock Island is an infant among American railway systems, but it is regarded as a fairly vigorous one, and, with its career worked out under wise counsels, no traffic property in the country should have a more enviable future. It is only fair to say that the promise of this already shows forth in the dispositions made for executive authority. The Rock Island is purely a Western road, if by this may be understood that it is a Southwestern, a Northwestern, and a Southern road. It is Western as opposed to lines within its territory that seek for, or enjoy, an Atlantic seaboard terminal. The Eastern terminal horizon of the Rock Island is definitely bounded by Chicago, where it maintains relations with all Eastern trunk lines. West of Chicago, however,

the Rock Island is practically everywhere east of Wyoming and the Rio Grande River. As if to emphasise its Western completeness it is building now into New Orleans, spending there $2,000,000 for terminals, and in these providing not alone for city business but, what is of more importance, for imports and exports. Anticipating the needs of five hundred years, it has acquired three miles of river frontage for its docks and warehouses, but of this abundant holding six thousand feet will take care of the needs of the present generation of traffic managers, who will direct Rock Island traffic to Galveston, New Orleans, or Chicago as conditions imply. The completion, too, of the 'Frisco line from St. Louis into New Orleans will witness the completion of the longest low-grade railroad line in the United States, being nowhere above eleven feet to the mile.

A road so Western in its territorial strategy is naturally managed wholly in the West. Western railroad men are in themselves a tower of strength. They stand for decision, action, and organisation. They are indefatigable, constructive, and, above all, resourceful, and to them America owes so much of its present excellence, notable the world over, in affairs of transportation, that the only danger in paying them too strong a tribute is lest it should seem to rob Eastern rail-

road men somewhat of their own high due. It is, however, undoubtedly true that poverty of material resources aids in the overcoming of difficulties. It stimulates mental ingenuity, and the Western railroad man has had the inestimable advantage of a stern frontier school. The operating and executive staff of the Rock Island is as markedly Western as its lines. Mr. Winchell, the president of the Chicago, Rock Island, and Pacific Railway, who finds himself at less than forty-six under so particular an executive responsibility, has behind him a Western record as continuous and rounded as that of most railroad veterans of sixty. Outside the motive power it would be difficult to name a single department of the road of which he is chief into which he could not step and perform with ease the duties of the head. Neither the auditing, the passenger department, the freight traffic, nor the operating would present serious difficulties to the president, since he has built up each of such branches on several different Western roads, and the most important of them on the system he now heads.

Within only the last ten years he has been general passenger and ticket agent of the Union Pacific, Denver and Gulf, and of the 'Frisco road as well, vice-president and traffic manager of the Colorado and Southern, president of the Kansas

City, Fort Scott and Memphis, vice-president of the 'Frisco System, and lastly and at once, first vice-president of the 'Frisco, of the Chicago and Eastern Illinois, the Evansville and Terre Haute, and third vice-president of the Chicago, Rock Island and Pacific Railway, in charge both of the operating and the traffic.

To carry the load implied in positions so exacting as these indicates extraordinary facility in despatching work, and the men Mr. Winchell is drawing around him are much of this type: men neither young nor old, but at the best of their executive power. Thus, one of the heads of Mr. Winchell's staff is a little younger than himself; a second has just turned forty, while the general superintendents are in their prime.

On these men falls the responsibility for the building up of the Rock Island System, and no railroad work, in all of the newer dispositions of railroad management and control, will involve more hard thinking or call for a heavier expenditure of vital energy on the part of a few men.

In the first place, the operating problems are momentous. A curious statistician has figured out that a union labour president of the Rock Island System travelling eight hours a day on a fast train would need all of sixty days to ride over his road, not to consider stopping for inspection;

but railroad presidents, not yet having formed a union, work sixteen hours a day, and could, therefore, make the trip in less. However, it would be obviously impossible for any single set of operating officials to get the best results in handling so extended a mileage, and the two chief constituent lines of the system, that is to say, the Chicago, Rock Island and Pacific Railway and the 'Frisco System, are likely to be co-ordinated in operating rather than merged. In the handling of large properties railroad practice has already found the limit beyond which it is not wise to extend the work of a single executive staff. If the seat of an authority be too many miles from the point of appeal on questions that call for prompt answer, efficiency becomes impaired. The railroad is no longer sensitively in touch with its customers; the opportunity to make the road respond to every profitable suggestion from shipper or superintendent is lost, and with it the highest development of local traffic.

But in this co-ordinating, this unifying, this assembling into a working machine of the crude materials of a railroad system lies a labour of infinite pains. It is not like the building of one engine after the pattern of another, for each railroad system presents, in forming, unique difficulties, and the builders of the newer can only choose

from the experience of the earlier what they deem suited to their peculiar needs.

The older Rock Island lines present work for the engineering department. No road representing physically the average conditions of a few years ago can hope for a place in the first rank of traffic to-day, and that the new Rock Island people understand this is shown in their moves toward betterment. These necessities, however, must be met gradually, and here, too, a nice judgment is needed. What may be taken by the Rock Island public as a token of the present policy is best shown in the new construction. The system is now filling in two links between important terminals, one from Chicago to St. Louis and one from St. Louis to Kansas City. The Chicago-St. Louis line is to be double-tracked eighty per cent. of the way, and though the St. Louis-Kansas City line runs through a rougher country than any road between the points named, it shows lighter grades and curvature than any existing line. In this new track-building, wood, with the exception of ties, has been completely eliminated. Bridges and culverts are of steel and concrete, the aim being to put the new road at once in advance of any present competition.

This much of the parent line. As to the 'Frisco, it being, in a way, a Southern road, one

expects less of it; yet it shows, somewhat as a surprise, in the getting of traffic, in immigration seeking, and in public service, an aggressiveness which older lines may be glad to follow. The 'Frisco runs fully equipped passenger trains between St. Louis and Fort Worth and between Kansas City and Birmingham such as need fear no comparison with the limited trains of the North. They are really years ahead of the necessities, but they are substantial aids toward the good will of the public that the road serves.

As to the system as a whole, the injecting of so much fresh blood into it within two years has naturally resulted in all manner of experiments. Not all of these represent final excellence; it is a matter of selection and rejection. But in the main they present the spectacle of the most conservative road in the West, so conservative that it has borne the reproach of being old-fashioned, being transformed into a road thoroughly up to date in its methods of securing and handling traffic. Not the least interesting point in these advanced ideas, and one that shows extraordinary results in the building of new States and Territories, is the wholly new method in the passenger department for attracting travel and immigration.

The department in the beginning stimulates inquiry by entering the lists as an advertiser, and

not as a conventional advertiser but as a bold and striking one. It makes its own every resource in the Yankee art of publicity, and, having attracted its audience, handles it with the tact of a mail-order house. It establishes, in fact, a mail-order branch in railroad administration. The old railroad way of sending to an inquirer merely advertising matter or a letter has been supplanted by the "follow-up" idea, and the Rock Island plans for getting results are almost as exact as the cost sheets of a manufacturer turning out a large product on a narrow margin of profit. Such a plan costs more, but it brings extraordinary results, and it is not too much to say that, at the moment, the Rock Island sets a pace in publicity efforts for every railroad that has need to build up its territory with families and farms and towns. To direct the tide of immigration in this country toward any particular section of it is an undertaking calling for much time and money; and that a single railroad system should have succeeded in attracting within less than a year so much attention to the Southwest must be gratifying to every road in that territory, since all share, more or less, in the prosperity that attends the building up of the States they enter.

In general, no feature of Western railroading is more active and efficient than the Immigration

Bureau. The Immigration Bureau is a territorial and social clearing-house through which the romances, the struggles, and the ambitions of primitive American homeseekers pass daily like bank checks. The Immigration Bureau is the builder of new settlements, new communities, and new States. It deals with the class of American citizens nearest the simple life, people wholly in earnest, tillers of the soil and small tradespeople who minister directly to their needs. This is the sturdy, industrial class that raises the crops, saves its money, talks no strange political doctrine, multiplies refreshingly, and attends strictly to its own business, and is the comfort of the sociologist that knows *his* business. The Immigration Bureau professes no politics and no one religious belief to the prejudice of another. It works industriously with the adherent of the older faith and the follower of the new. On the plains of the Dakotas, or of the Texas Panhandle, or in the far counties of what is now Oklahoma but was a few years ago No Man's Land, it plants within gunshot of each other colonies of Dunkards, Mennonites, Baptist Brethren, Lutherans, and Catholics. The best of these pioneers are to-day, as our forefathers were, people of strong and simple religious faith, and when an immigration agent asks a concession in behalf of

such a prospective colony he urges naïvely that "a settlement of Dunkards or Mennonites means more settlers in the future." Race suicide makes no inroads upon these frontier colonies. The head of the family may trim his whiskers with a scythe and shape his hat over a coffee-pot, but he pays off his mortgage notes and has wheat in his barn.

The rapidity with which these thrifty folk accumulate is astonishing. Twenty-eight small towns, and, necessarily, all new towns, in northern Oklahoma, in 1903 showed fifty-seven banks with deposits of $3,957,000. The town of Anadarko returned to the Rock Island in freight receipts in 1900, $62,000; in 1901, $172,000. Hobart, in 1900, returned $28,878; in 1902, $309,168. Hobart ticket sales, which in 1900 were $877.37, were, in 1902, $42,833.71. Lawton, in a year, ran up from $138,000 to $352,000 in freight earnings. El Reno, in passenger earnings, rose in a year from $63,000 to $195,000.

The figures, to those who have not noted the development of our Southwestern frontier, are astonishing. The older portions of Oklahoma are already so well settled and improved farms are held so high—$30 an acre—that the alert Immigration Bureau is already preparing to divert the Oklahoma overflow to the newer lines

in the Texas Panhandle and New Mexico, where large cattle ranges are being thrown open to small farmers.

It seems more extraordinary still that so old a State as Missouri should be fertile ground for an Immigration Bureau. Though Missouri was admitted to the Union years before Iowa, it has fewer school-houses and fewer school-teachers than the younger State, and there are still whole counties in Missouri without a railroad.

Yet Missouri, in profusion of natural riches, is without a parallel in the United States. The operating officer of one of the greatest railroad systems in this country, a man of wide executive experience, riding down the beautiful Mohawk Valley one evening in his car, declared that if obliged to choose from all the Union a single State, and build a wall around it that he was never again to pass, he would choose Missouri; and the adage is one to which all Missourians are loyal.

The resources along the new Rock Island line recently built across the State, putting aside an unrivalled climate and agricultural possibilities of every sort, are described by an immigration scout as comprising great ledges and hills of iron ore, all manner of mineral wealth, coal veins twenty to eighty feet thick, timbered tracts of the highest

class and quantity, and large areas of farming lands, cultivated and uncultivated. Why, one would ask, build railroads in Alaska? Indeed, his report, fully read, at once brings up the question, Why does not everyone live in Missouri?

Yet the people seem open to other convictions. In Oklahoma 40,000 settlers have been placed along the new Rock Island lines alone. Within the year Oklahoma City has increased 10,000 people, a second town 6,000, and a third 3,000. Where Government lands are open for settlement filings are running 600 a day. New Mexico towns, too, are doubling up in a twelvemonth under the stimulus of the railroad work. Towns rejoicing in names such as Alamogordo and Tucumcari support jobbing houses. And more consoling instances remain. Eastern Colorado will commonly be acknowledged as being, from the car window, quite hopeless; yet farmers there make good livings without irrigation by raising Irish potatoes. The country is the paradise of the sick man, and again the immigration scout comes in with a specific instance of a man whose name, I have pleasure in recording, is Syke. Syke started from Ohio fourteen years ago and is described as reaching eastern Colorado with poor lungs, hæmorrhages, and cash $2.50. He homesteaded 160 acres, and his neighbours

"broke out" a portion of it for him the first year. On October 13, 1903, Syke, as hardy as an oak, and ploughing potatoes in his shirt-sleeves, owned the whole section of 640 acres, was feeding fifty head of stock, and whispered to the railroad emissary of money in the bank. Who for fourteen years can better the record of Syke?

The Western railroad does not stop at colonisation; it is equally a bureau of agriculture. The Government conducts such a department, but it is the railroad that spreads the information supplied by the Government and supplements its work by local experiment stations, the distribution of literature and seeds, and that close-at-hand urging that gradually compels action among cautious farmers. In this the work becomes one of the greatest prudence. The railroad must know precisely what it has to offer in the way of climate, soil, natural resources, and business chances or opportunities for investments. These are its attractions, and they must be put before the inquirer with definite understanding of his needs and how they may be filled. The Burlington for years maintained an experiment farm to demonstrate to farmers of the semi-arid region methods of subsoil culture. The Rock Island lines have taken up a peculiarly hard Russian wheat known as durum

or macaroni wheat, and have found in it a grain clearly adapted to the dry, hot climate of our table-lands west of the one hundredth meridian. Russia exports 40,000,000 bushels of this wheat a year, and the Volga district which produces it receives a smaller rainfall than our own Western plains and a very similar distribution. The Department of Agriculture has known of this grain for forty years, but the practical difficulties in the way of its culture have been enormous. There has been thus far no developed domestic market for this valuable product. Millers have refused to buy it because its extreme hardness makes it expensive for milling, and it will not mix with other hard native wheats. Yet such a grain is the wheat salvation of an agricultural region covering thousands of miles of rich soil under a low rainfall, a dry atmosphere, and an intense summer heat.

Here the railroad takes hold. Its industrial bureau not only arranges with Minneapolis millers for milling facilities for the hard wheat, but also investigates export markets. In this way the Rock Island has learned that grain brokers at Marseilles and other Mediterranean ports stand ready to handle all the macaroni wheat that is offered, and it "follows up" by investigating freight rates from Russian competitive points and making a rate across the world that will put its

local farmer for an export basis on a parity with the Volga moujik.

The whole process strikingly suggests Mr. Hill's industrial work in a wholly different direction, but both are instances of what the Western road is doing in building up new territories and new markets. Some of these roads have lands to sell; others, as the Rock Island, have none. But they all understand that their prosperity is bound up in the development of local territory; that the greatest care is needed to avoid deception or misunderstanding in their advice to inquirers, and that there is, after all, no friend so vital to the prosperity of the Western railroad as the contented settler.

THE ATCHISON

THE ATCHISON

On the careers of many Western roads lights and shadows have fallen sharply within the last ten years, but on none with so striking a contrast of good fortune and bad as on the Santa Fe.

There have been periods, and those almost recent, when it seemed as if all of the railroad disasters of the West, whether of hard times, of crop failures, or of unfriendly legislation, had camped together on the trail of the Santa Fe. In 1896 many bad men came out of the West; but of those that rode over the railroad pike no discouraged miner, no burnt-out farmer, no starved-out cattleman had more of a hard-luck story than the Santa Fe Railroad. Indeed, it may be pictured about 1896 as a lone frontiersman heaving in sight under the sorriest of hats and on the leanest of ponies, with mustaches sweeping his chin at half-mast.

In matter of fact, every wind that blew from 1890 to 1895 blew bad luck to the Santa Fe. Dividends had become in the treasurer's office a

mere tradition; the defaulting of interest was more regular than the train service. The company, both physically and financially, was discredited. Many of its obligations toward the shipping public had been repudiated; it had no standing among bankers, no character among engineers, no friends among customers, no respect among competitors; contempt it found everywhere, countenance nowhere.

What makes the Santa Fe's experience so extraordinary is that within five years thereafter it had been lifted completely out of this railroad slough of despond, and, the vane of its fortune responding to wholly new influences, the great road saw restored to itself all the prestige it had once enjoyed, based on an incomparably wider and deeper foundation than it had ever before rested on. More singularly still, this unusual rehabilitation has been brought about entirely by the management of the road itself and not through its being absorbed by any strong banking house or big railroad magnate. The Santa Fe has not been "absorbed" by anybody. Even among independent railroads it stands with especial distinctness outside any combination or sphere of influence. There are independent roads in plenty that are still Morgan roads, or Kuhn-Loeb roads, or that take suggestions from some one of the half-dozen

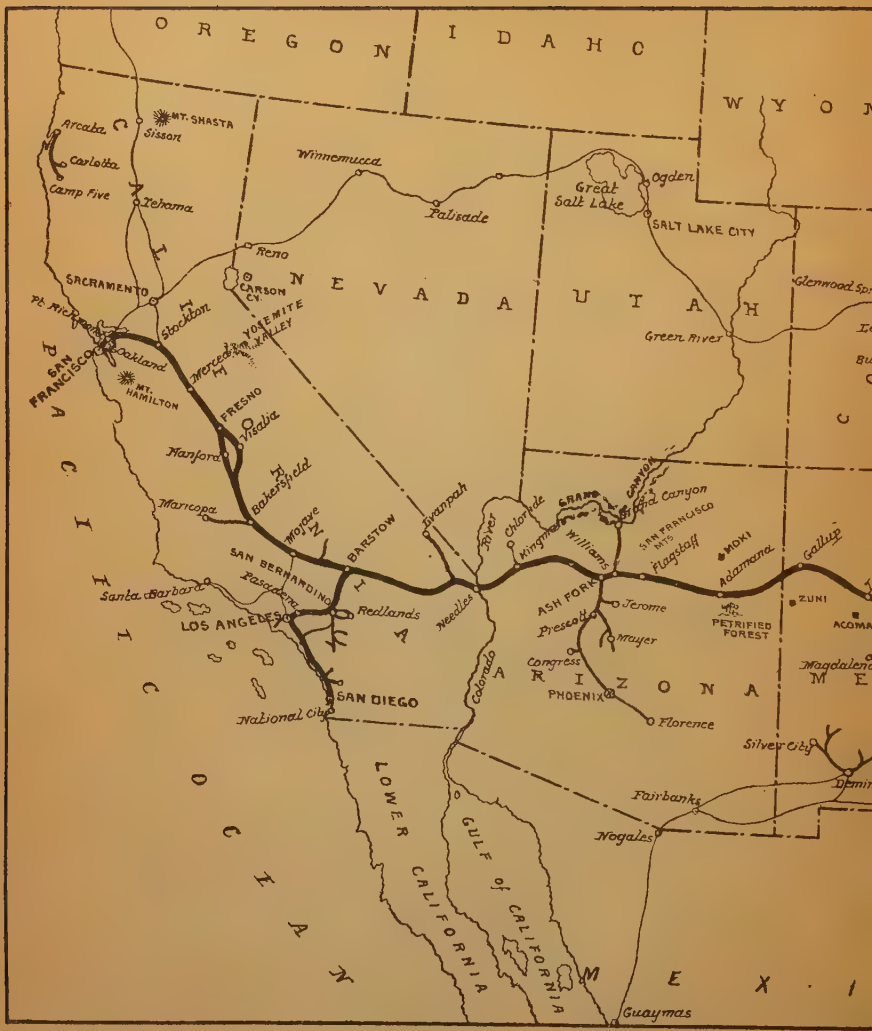
powers in the railroad world. The Santa Fe takes orders neither from bankers nor syndicates. It is a Western road run entirely by its own official staff of young Western railroad merchants, and what makes its story of especial interest is that it is in reality the story of a railroad man—Edward P. Ripley.

When Mr. Ripley, in 1896, took hold of the Santa Fe as its president he did so greatly against the advice of his friends. His own record was one of success, that of the road one of failure; and for him to ally himself with an institution of so doubtful a name and record was a matter of concern to his well-wishers. He assured himself, however, of one thing to start with: a good corner to work from. Of all reorganisations after the panic of 1893 none was more drastic than that laid out for the Santa Fe. The fixed charges of the company were cut squarely in two, and in order to keep the sheriff afterward out of operating headquarters, it was necessary for the company to earn only half as much as the old company had earned. Starting under Mr. Ripley's management on that basis, the road has never since left solid ground. It has earned not only its dollar of fixed charges, but within the seven years just passed has more than doubled its gross earnings; and while increasing its mileage in that

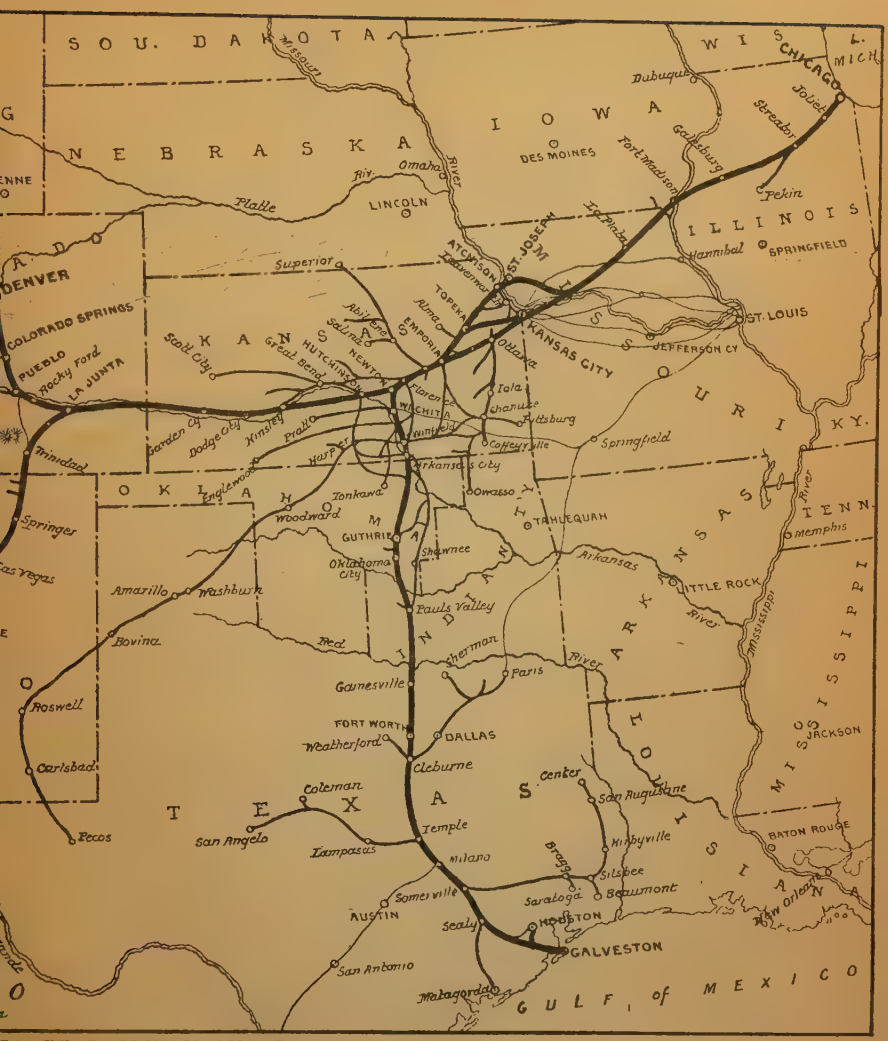
time less than one-fourth it has increased its earnings per mile more than two-thirds.

Chance will hardly account for such a showing: gross earnings of $68,000,000 last year, against $30,000,000 in 1897, and $8,300 a mile, against $4,750 seven years earlier. It has been done without spectacular display. In the Santa Fe management pyrotechnics have been wholly lacking. What, then, are the methods by which this road has been placed in so short a time in the very first rank of American railroads?

The Santa Fe has in its president a man who is by nature of a judicial temperament. He has the characteristics of a judge well poised, and had his fortunes inclined to the law, Mr. Ripley would have been eminent as a jurist. He is a man apparently unconscious of his strength. He is wholly unpretentious, yet in the struggles that Western roads have of late years made for better railroad practice he has always been foremost, and that notwithstanding the fact that the taking of advanced ground has at times been to the disadvantage temporarily of the Santa Fe. Indeed, what the railroads of the whole country owe to the fight this man and his like have made for proper methods and good practice among Western railroads it is difficult to estimate. Without the effort to this end in which the best Western



THE ATCHISON, TOPEKA



TA FE RAILWAY SYSTEM.

men have stood firmly together, the transportation business of the country to-day could hardly have been brought to the position into which Mr. Cassatt has worked so hard to put it.

The head of the Santa Fe in this way has commanded both the respect of railroad men and the confidence of his associates. He has stood among competitors as prudent and dependable, and his straightforwardness has won the loyalty of his subordinates. Though incurring at times the displeasure of autocratic shippers who, desirous of buying transportation in large blocks, have found that Mr. Ripley was opposed to preferential rates and rebates, he has in the end forced even them to recognise the justice of his position.

Put such a man at the head of an army of 30,000 men and he becomes a figure in the railroad world; and with this light on his character an understanding may be had of how it comes about that an American railroad, merely by the application to its management of sound business principles, may attain the most enviable success.

Railroad combinations, it is true, within five years have done more to centralise control than had been done previously in two generations, yet the fact must not be lost sight of that, with practically all done in this direction that can be done until a new generation of railroad men and wholly

new powers in finance arise, competition still exists everywhere. At the beginning of 1905 every railroad point in the United States is a competitive point.

The Santa Fe makes its headquarters in Chicago. In railroad control, indeed, Chicago may be called the continental divide. Many roads run into Chicago but practically none run through it; it is a case of change cars for everybody. In Chicago, therefore, railroad activity is to be looked for, and there it is found. The position of the city, unique in several ways in the railroad world, makes it a point at which in railway matters steam is always "up." In Chicago may be found the operating and the traffic officers of the most powerful railroads in the country. There are in Chicago half a dozen private offices where one may find maps that pieced together would make a very respectable supply of railroads for the United States if all other roads were done wholly away with; and these maps, drawn on unusual scale and precise as the field plans of an army corps, represent only the lines controlled by the half-dozen officials for whose use they have been made.

As to the West, all of its railroad destinies are shaped in these Chicago offices. In Chicago one man sitting at his desk makes a rate with his pen-

cil from his Chicago terminals over his own rails to his terminals in San Francisco—but by no other man in the United States can this be done. The five men who in authority that is absolute are traffic directors of two-thirds of the United States may be found almost every day within a few moments' walk of each other in Chicago.

Showing as it does in this way the rather startling possibilities of the day in railroad control, Chicago is likewise the place to look for some of the impossibilities, for above all other railroad terminal points it exemplifies them. It is the very head centre of the independent road of this day. In Chicago one is brought to realise that the forging of new links in railroad chains is a good thing for the country just as long as it is good business for the men that attempt it—and no longer. Chicago, too, forces in the end the conviction that the situation is so much bigger than any one man—that the country develops so much faster than any one man in it, even a fabled Rockefeller, that a monopoly of railroad control, so far as immediate generations are concerned, is the spectre of a dream.

The widest possible differences in theories of railroad management exist side by side in Chicago. One great operator looks first and always to a particular feature of his reports: the expense

account. Another operator, equally powerful and equally able, holds that a low expense account does not necessarily make for the quickest development of his territory and not, therefore, for the best interests of his road. The first, acting on his theories of management, holds the car of wheat of his farmer on the siding until he can include it in a freight train heavy enough for the full capacity of the locomotive assigned to pull it. The other operator holds that the farmer's grain must be marketed at once. He maintains that he cannot afford to leave wheat on the sidings or in the yards till he gets the maximum tonnage for an engine. Move the grain; time is money. The farmer's capital is tied up, the argument runs; release it promptly and begin over again. It will cost more for the train-mile, but not enough to warrant holding back the movement; the American way is to look for quick returns and more business. Apply these ideas to the whole field of railway management, and the germs of quite different philosophies are seen. A larger expense account may not necessarily mean a loss; it may stand for a stimulation of traffic that will develop more and stronger shippers and bigger dividends.

In Chicago those that like to see large railroads merged in control and well operated—and

no road can be well operated without benefiting the territory it serves—may find them; and those observers who fear that against such combinations independent lines no longer have a chance for their existence may see them in Chicago absolutely the peers of the most powerful competitors.

This, then, is the atmosphere in which the Santa Fe thrives. Untrammelled by any connection that can swerve it to the right or to the left in railroad affairs, it maintains friendly relations with all of its neighbours and contracts entangling alliances with none. It is the one big, red apple still left on the railroad tree, hanging so high that thus far no magnate's pole has been able to reach it, although George Gould, J. J. Hill, and E. H. Harriman have cast longing eyes in its direction. Surrounded by railroad groups and rumours of groups, the aloofness of the Santa Fe is as refreshing as an inspiration, and to the man looking for an example of an independent road ruddy with prosperity it is an oasis in the combination desert.

In the big national railroad game in which by reason of its size and strength it plays every day, the Santa Fe strategy is characterised by its blunt candour. There are roads that jealously hold up their cards, that assume a mysterious air and negotiate from behind a mask. The Santa Fe's tactics are as open as its strength. It throws

down its cards frankly: Here is what we have; what have you? Business may be done with such a road if one talks concisely and to the point; but when it knows its own strength and has a pretty shrewd idea of all that is out against it, bluffing is futile.

Management of such a sort will succeed outside a combination quite as well as within one. The Santa Fe men are young men in the sense that they are particularly alive, and they come from a good railroad school. In 1878 Mr. Ripley was general freight agent of the Burlington, and Mr. Paul Morton, now Secretary of the Navy, was a clerk in his office. Just why the Burlington has graduated so many more big railroad men than its natural share no one seems clearly to have determined. But Burlington men are as widely prominent throughout the United States in railway management as Ohio men are in public offices. Notwithstanding the fact that the Burlington was some time ago absorbed by the Northern Pacific, the Burlington Howard Elliot appears already to have absorbed the Northern Pacific presidency. The New York Central and the Lake Shore roads are operated by a Burlington man, William C. Brown, and two men from the Burlington have managed very largely the destinies of the new Santa Fe.

What the Santa Fe stands for that is unique among American roads is the present position and unusual length of its main line. No other road that owns a Chicago terminal can boast a straightaway line into San Francisco Bay.

Geographically, then, the road is of especial interest; but it stands also on the most debatable railroad ground in the country. Not only is its competition widely distributed but of a character the most intense and incalculable. The Santa Fe from Chicago strikes straight into the heart of the Gould lines territory. At the Missouri River it meets practically all comers—Hill's pet, the dangerous Burlington; Harriman's crack line, the superb Alton; the always powerful St. Paul and the new Rock Island; besides the liveliest of the Gould lines, the Wabash and the Missouri Pacific. The Santa Fe from Twelfth Street to Kansas City lies in a blaze of competition that would melt ordinary railroad abilities, and west of the Missouri River the map broadens into the Colorado territory. The St. Paul, then, has dropped out, the Wabash is out, the Alton is out, but Harriman is there with the great Union Pacific, and Chicago competition is again added by way of the keen and far-reaching Chicago and Northwestern. Hill remains with the Burlington, and the new Rock Island is there, as it is again on the

Gulf of Mexico, where the Santa Fe must also lock horns with George Gould on his stamping-ground and with Harriman again in the Southern Pacific. This is surely business enough; but the Santa Fe, with a jump that leaves all but the very giants of the Western world behind, crossing the desert wastes and the continental divide, opens its freight-house doors on San Francisco Bay. Here the competition again takes on new features. It is not alone the powerful competition of its own territory—the Southern Pacific intrenched behind an unbroken monopoly of thirty years in its own stronghold—that must be reckoned with now—it is also Vancouver, Puget Sound, and the Canadian roads competing for the traffic of the Orient.

Thus the combinations that engage the Santa Fe management are as wide as the continent, and what the odds are against the Santa Fe may now be reckoned. It is practically the Santa Fe against the field. The first great move that Mr. Ripley made to give the Santa Fe absolute independence was properly to open his California outlet. He found the Santa Fe unable to land its freight in San Francisco save over a hostile connection, and he severed the cord that was strangling it by acquiring his own rails into northern California. With his terminals thus firmly fixed at Chicago and San Francisco he has rested con-

tent in his own territory. Beyond the fight he has made for proper rate conditions and due recognition he cannot be said to have indulged in offensive measures. His energies and those of his staff are turned at all times in the direction of developing their local territory, and in this the success of the road has been almost phenomenal. In oil alone, which it uses everywhere in western Arizona and California on its locomotives, the Santa Fe carries ten thousand cars a year where formerly it carried none locally in California or Texas.

Though meeting in the most liberal way mine owners and people interested in developing the Southwest, and adopting a policy of not charging locally more than the traffic will bear, the Santa Fe has been largely instrumental in preventing preferential rates to the owners of private line refrigerator cars, and has eliminated them entirely from its own traffic problems; and this sturdy determination to put all shippers on a just and equal footing, to maintain open and even rates, is the note of Mr. Ripley's successful strategy. Like all men that achieve unusual success, the head of the Santa Fe is studied curiously by the world, eager to get at the secret of how such things have been done. When the facts are known the world stands surprised. Instead of a cabalistic formula

for getting on, the curious inquirer has found merely the simplest, oldest principles of doing business—common-sense in generous quantities, well grounded in common honesty.

The work of the Santa Fe to-day is that which must for fifty years to come absorb the attention of every Western road—the colonising of local territory, the planting of a family where only a cactus grew before. To this end its people preach the gospel of irrigation and spend extraordinary sums in advertising the resources of the West.

The steady growth made by it in mileage and in earnings throws a curious sidelight on one feature of American prosperity directly attributable to this pioneer work, and one which within seven years has become so pronounced as to take on the proportions of a mystery. In the disastrous stock panic of 1903 the East, frightened at the bursting of its own prodigious bubble, looked for a national panic. London and the Continent shared the apprehensions of New York. But the panic did not materialise; Wall Street's poor relations, the Missouri and the Iowa farmer and the Kansas and the Nebraska homesteader, came to the rescue of the country with their blue jeans bursting with cash. Credit has been frankly accorded to the West for its aid, but Wall Street hardly understands yet where the money came from, and

that a portion of the glory is the due of the railroads.

In the early days the Western farmer, having no money to buy cattle or hogs, marketed his corn—frequently without its being even shelled. To-day he owns his own feed lots, his cattle, and his hogs. Five carloads of corn feed one carload of steers and one of hogs. But the corn, if marketed instead of being fed, would pay a higher rate per car—owing to its greater weight—than an average car either of hogs or of cattle. Instead of paying freight on five carloads, then, as he paid ten years ago, he now pays freight on but two carloads—a reduction in freight expense of three-fifths. Moreover, at Kansas City, or some other Missouri River point, two cars of his steers are made into one car of dressed beef, and this is hauled to Chicago at about the same rate the carload of corn pays. Here, again, the amount paid for freight charges is cut in two, and the farmer directly benefits by it. As a result, the farmers have been getting thirty-five to forty cents for corn they used to sell at ten and fifteen cents a bushel to be cribbed. In addition to this it may be estimated that they realize at least fifty per cent. more for the corn they feed to stock. The situation, then, to-day is that the farmer, who at one time had to lose all but the producer's profit in raising corn,

has added to his balance-sheet the manufacturer's profit of changing corn into pork and beef. Small wonder that he has an occasional surplus to lend in Wall Street; and his prosperity has been no slight factor in the remarkable showing of the Santa Fe.

Standing as it does, directly out in the spotlight of the railroad stage and still absolutely unaffiliated, the great road engages in turn the interest of each of its powerful rivals. A combination of the highest strategical importance to it would lie in a tie-up with the Rock Island. The Santa Fe would, in that event, stand west of Albuquerque as an exclusive ally for the Moores to the Pacific Coast. Under such a combination an exchange of trackage east of Albuquerque to form the shortest possible line would result in an extraordinary shortening of the distance between Chicago, St. Louis, and Kansas City and Los Angeles and San Francisco. It would even be possible for a contract to be entered into between the two companies as they now stand highly advantageous to both.

But more tremendous in consequence and of a nature that might mean the recasting of every American railroad plan existing to-day would be the absorption of this youngest of the Western transcontinental giants by the Pennsylvania lines.

In such a move would lie possibilities calculated to keep the railroad world sleepless for long nights to come. If in retaliation for the invasion of its territory by the Gould lines, whose transits already bear on Baltimore, the Pennsylvania should buy the Santa Fe it would at a single step cross the Rockies and run its engines from ocean to ocean.

THE BIG GRANGER LINES

I. The Chicago, Milwaukee and St. Paul Railway

II. The Chicago and Northwestern Railway

THE BIG GRANGER LINES

I. The Chicago, Milwaukee and St. Paul

Thirty years ago the farmers of the Northwest set vigorously about reforming the railroads. Over Wisconsin, Minnesota, and Iowa ran an epidemic of railroad legislation as lively as a prairie fire, and the movement took on a political activity that surprised the country. The organization through which the farmers worked was a fraternal association known as the Grange, and the movement became famous as the Granger movement.

The Grange has gone the way of all orders political; its legislation lies forgotten on the statute books. But the movement left those railroads lying within reach of the Granger laws a name that survives; Wall Street dubbed the Northwest roads The Granger Lines, and prominent in the group, then as now, is the Chicago, Milwaukee and St. Paul Railway.

In this system lies the story of the first railroad built in the State of Wisconsin. This was the first road to give an Eastern outlet by rail to the cities of St. Paul and Minneapolis, and one of the

very first roads to adopt the system of shipping grain in bulk, which marked the beginning of the modern grain elevator. The St. Paul Road is essentially a Wisconsin road in its beginnings—the work of Wisconsin men and a product of Wisconsin planning. It is founded on three little railroads, one of which was planned within ten years after the definite settlement of Milwaukee and Wisconsin, in 1836. The story divides itself very clearly into two periods: the first before 1887, when Wall Street influences controlled the road's possibilities; the second after 1887, when the St. Paul shook off speculative control and became a railroad in the true sense. The year 1887 marks the real turning point in St. Paul fortunes; after that no more fancy branches, no more speculative rigging, but straightaway railroading; and such it has been ever since. From beginnings that were random a system has been built up so unified now that each of its constituent lines has been merged even as to corporate organization in the big parent company. The St. Paul controls no subordinate lines; it absorbs them, makes them a part of itself, and their identity becomes merged absolutely into the strength of the whole system. To-day it has no corporate creature permanently within its fold.

This policy is by no means accidental. It is a

policy of individuality, so to say, the result of a well-defined plan of the real St. Paul founders, and it will be interesting to watch its development to the minute details of management. For twenty years the system has adhered to a clearly marked course. It has acquired distinct policies and they have become a code. It is almost a St. Paul maxim, for example, that the worst use you can put a man to is to discharge him. St. Paul men have come from the operator's key through all of the intermediate steps even to the president's table, and the acumen, administrative ability, and strengthening judgment of men distinctly St. Paul bred have been recognized in the whole American railroad world. The St. Paul, like the Burlington, has become recognized as a railroad training-school of the first order.

Of the territory in which these St. Paul lines were originally projected there has never been but one opinion: State for State it has probably no industrial equal in the world. Minnesota alone raised last year one-ninth of the spring wheat crop of the United States. Illinois produced one-tenth of all the grain raised in the country, and Iowa one-tenth of all the corn. Iowa's entire grain crop amounted to 300,000 carloads. North Dakota contains 76,000 square miles, and practically every acre of this land is tillable. South Da-

kota is even larger, with 86,000 square miles, and outside the mineral wealth of the Black Hills, is given wholly to agriculture, dairying, and stock-raising. The Dakotas are, in effect, vast national granaries and meat preserves, and the St. Paul counts 1,200 miles of track in the Dakotas and 1,800 miles in Iowa.

Wisconsin in resources is a nation in itself. It is the most cosmopolitan of our States, and three-fourths of its people are of foreign birth or parentage. Wisconsin counts 100 grasses, and, if nature has denied to it coal, it has given to it sixty forest trees. Swept by glaciers ages ago, the landscape hollows of this early moraine present an unending variety of lakes: it is the land of lakes; there are some two thousand scattered over the State, and they are notable for every charm of the forest landscape. They lie in a climate more rarely favored than any of our national playgrounds. They have the seclusion and the charm of the English lake and the sun and the air of Switzerland. Their elevation, even, is a surprise. One of these landscape mirrors, Trout Lake, lies more than one thousand five hundred feet above the level of the sea—almost a thousand feet above Lake Michigan, close beside it. In Wisconsin's forests are the spruce, the pines, and the larch and the arbutus springs from under

the snow; the yew is there and the birches, the wild iris and the violet, the bluebell, the clematis, and the brier rose.

Into this rich territory have come people from every State in Europe save Turkey. They have made their own settlements, preserved in many interesting instances the best of their native customs, clung tenaciously to their religious faiths, worked unceasingly and prospered. Wisconsin as a commonwealth is a study in industrial contentment. To the whole Northwest this admixture of foreign peoples in Wisconsin has shown the remarkable industrial possibilities in dairying. The abounding springs, the rushing waters of the rivers, and the cool of the clear, deep lakes in Wisconsin all suggest the dairy, and native grasses afford the richest of grazing for the herd. On the wild beaver meadows of northern Wisconsin the prairie blue-stem is found, the bunch grass of the plains, the grama and the buffalo grass. The baled hay brought years ago into the logging camps has fertilized the lands left desolate by the lumbermen. And not alone have cattle a first place on these cut-over lands; sheep are brought from the Wyoming and Colorado ranges, summered on Wisconsin herbage, and brought in the fall to the Chicago market as grass-fed mutton. On the raw brush land the Angora goat thrives,

and not only civilizes, but fertilizes, the soil where it browses. A flock of a hundred Angoras is equal, it is said, to the best woodsman in clearing cut-over brush lands.

In Minnesota white men found the buffalo and the wild horse. Old Jonathan Carver, writing more than a hundred and thirty years ago, describes the flow of the river St. Pierre through a region where trees bend under their weight of fruits, where meadows are green with the vine of the hop, and the waters teem with celery and wild rice; where the earth is stored with useful roots, with angelica and spikenard; where bluffs rise boldly and are crowned with hickory and maple. Carver tells of the wild duck and the swan, of the brant and the goose and the partridge and the wild turkey. This is Minnesota: its beauty, fertility, and lasting charm have stirred red men and white. Into this land have flowed for the last fifty years the hardiest strains of the blood of Northern Europe, the big, light-haired, blue-eyed people who rejoice in the work of the field and glory in the chill, bright sun of winter. In Minnesota there are dainty cataracts, lakes that lie in chains, and forests not yet wholly sacrificed to American haste and waste.

To railroads it would be hard to present a more tempting field, and the growth of the rail-

road in such a territory is an easy and natural following of the territory's development under the aids of industry and transportation. To put the matter very simply, the story of the railroad in the Northwest is the story of the wheat-field. There were lesser interests, of course, as when a road was built into a timbered country for the lumber traffic. Grain, however, in the beginning was the chief matter. What is most unexpected in the growth of Northwest traffic is the way in which, on the Granger lines, grain as a traffic king has been dethroned. The explanation, too, has its peculiar interest in this: that the wheat-field is continually being pushed further West. This has always been so; with the vanguard of civilization the wheat-field has followed the frontier. It has been driven in earlier generations from Illinois, Wisconsin, and Iowa. It lies now west of the Missouri River and north in Minnesota and the Dakotas. Oddly enough, too, checked on the west by the Rockies, it has turned north, and to the north it is receding with a swiftness that is startling beyond our national boundary line. When our first transcontinental railroad was built, men attempted by isothermal demonstration to prove that wheat could not profitably be grown north of where the road was projected; but the real granary of the world lies up to three hundred

miles north of the Canadian Pacific Railroad, and the day is not indefinitely distant when the United States will knock at the doors of Canada for its bread. Railroad men see such a day; it may be hoped that statesmen also will see it and arrange their reciprocities while they may do so gracefully. Americans already have swarmed into that far country and to a degree have taken the American wheat-field with them. Despite the fact that for years a little Dakota station on the St. Paul Road —Eureka—held the distinction of being the largest primary grain market in the world, the Dakotas and Minnesota will one day yield their palm to Saskatchewan.

The St. Paul, then, being a Granger line, began with the wheat-field. Within the ten years since 1894 the shifting importance of the grain movement is told in the traffic reports. In 1894 grain made up thirty-two per cent. of St. Paul traffic; in 1903 it made up only twenty-three per cent., yet the St. Paul System carried twice as much grain in 1903 as in 1894. In spite, therefore, of a constantly increasing grain traffic the growth of other traffic in St. Paul territory has in one decade crowded the grain percentage down almost ten per cent. in the totals. The explanation is diversified farming, manufacturing, and that increase in miscellaneous traffic that follows growing

wealth in a community. Diversified farming has taken possession of the Granger lines territory. The old-time hazard of a single crop is quite a thing of the past in Iowa, Minnesota, and, to a great extent, in the Dakotas, where, in the beginning, only wheat was raised. The St. Paul goes back to the day when wheat was shipped in bags. The receiver of one of the early roads merged into the St. Paul asked for a court order authorizing him to build a grain elevator at La Crosse, Wis., for the purpose of handling shipments of grain in bulk. Grain came down the river then in barges, and the St. Paul Road began shipping bulk grain over its rails from Prairie du Chien, and the St. Paul, growing in prosperity, has lived to see the wheat-field, like the Indian, constantly recede, and to see the decline, through changing conditions in transportation, of that grain-elevator system which for one American generation was a supreme industrial achievement.

As early as 1870 the Milwaukee and St. Paul Road had become important in Northwestern activities, but Milwaukee, at one time the greatest grain market of the world, was then being passed by Chicago. A Chicago terminal had become for any road in the Northwest an absolute necessity, and the St. Paul built to Chicago and added Chicago to its name. The movement was a

blow dreaded by Milwaukee, but as is often the unexpected issue, the growth of its original railroad has resulted in strengthening Milwaukee itself. Built by Wisconsin men, the system for many years was manned by Wisconsin men, but outside blood was good for the road as it grew. When Sir William Van Horne came to the St. Paul from the Alton as general superintendent, he felt so quickly this atmosphere of solidarity among the employees that he said if a man were kicked in Milwaukee he protested on the Missouri River.

For transcontinental traffic, then shaping its way through Chicago, an Omaha line had, even in 1870, become logical, and fitted easily into the growing extensions in Iowa and Dakota. Sometimes a war measure became a feature of St. Paul extension, as when the Burlington built up the Mississippi River to St. Paul and Minneapolis, and the St. Paul flung an anchor to leeward in the shape of a line to Kansas City; but the true importance of this Southwestern outlet, built as a retaliatory measure, was not apparent when it was planned. As some of the early branches built by Wall Street speculators were builded better than they knew, so the Southwestern extension of the St. Paul has in late years taken on a wholly new significance.

When the attempt was first made to export grain to Europe by way of the Gulf of Mexico, it was found that the cargoes lay so long in sailing vessel holds in the heated Southern waters as to suffer damage. The big, swift tramp steamer, however, has changed this and carries Gulf grain to Liverpool in safety. As a consequence the Gulf is a constantly growing factor in the export of grain, and the Atlantic seaboard a correspondingly declining factor. Such a shifting of traffic puts new and rather grave problems before a Granger line. It is the men watching these constantly moving industrial tides who alone can estimate their force. In private offices like those of Chicago traffic managers this Gulf tide rising year after year has been steadily watched, quietly but with no feature of its significance overlooked, and when it comes too high into the North the Granger lines will buy or build to the Gulf, and with the longer haul afforded them will make more money than at present on their grain. What the St. Paul may do in a southern direction it would be hazardous to predict as it would be to say what it may some time do in a northern. This much is obvious: the Granger line began with the wheat-field and has followed it closely into Minnesota and the Dakotas; if it moves into and up the valley of the Red River of the North, such

a step could occasion no surprise, and it will naturally seek to carry the grain as close to tidewater as its competitors carry it.

George B. Roberts of the Pennsylvania once paraphrased an aphorism to the effect that when a railroad ceases to be aggressive it is the beginning of decay. In the sense that all live roads must be, the St. Paul is aggressive. Beginning with wheat it became an ore road and a lumber road. Its northern development drew it naturally to the Lake Superior country and resulted, through the lumber traffic, in establishing further south an army of manufacturers on its lines. In mineral traffic it has not only a strong footing in the iron and copper countries of Lake Superior, but it has the lead traffic of southwestern Wisconsin. The building of the first lines into the Lake Superior country now makes necessary new dispositions to meet changing conditions.

Northern Wisconsin settlement began with the felling of its timber. Wisconsin and Illinois have in consequence grown to be vast manufacturing plants, but with the cutting away of the timber the factories are casting about for new fields of supply in raw material. North of Lake Superior in a belt two hundred miles wide and three thousand miles long lies one of the last of the great North American forests. To this region

of the Northwest the factories are turning for their lumber, and the St. Paul must prepare on the south shore of Lake Superior to transship this material which will come across from Canada, and carry it to its manufacturers as far to the south as Rock Island.

I have spoken of the individuality of the St. Paul Road. It is too marked to overlook. From its men it has long enjoyed a quality of loyalty that is exceptional. In the days of the great railroad strike of 1894 there were whole divisions on the system where the disturbance was never felt. It is a saying that a man who once works for the St. Paul always works for it, and so strong is this sentiment among the older men that even in these days of rampant and disordered trades-unionism there is a leaven of loyalty among St. Paul employees that amounts almost to a company asset. To-day there is no problem more grave in American railroad management than that of enlisting the faithful endeavor of the employees; and this despite the fact that the older men in the railroad service set a remarkable example of fidelity to their work. To continue to-day to secure the results effected by the railroad employee of fifteen years ago is rightly esteemed a triumph of management, and one to which the St. Paul may pretty fairly lay claim. A general

officer of the St. Paul leaving the system ten years ago would return to-day to find himself known by name to men, on outlying divisions, whom he had never heard of. The old-fashioned railroad had this brotherhood feeling from top to bottom, and it is something we have lost in the enormous growth of the various systems. The spirit when, for example, the Rock Island was a sort of Cable family road—when if a member of President Cable's family in Chicago was ill men in Kansas asked for news from the sick room—is perhaps lost forever from American railroading; but it counted in the traffic results just the same, and any road that preserves a spirit of such personal interest in its management is fortunate.

To this clan-like following of the men may be added a second and very different characteristic of the St. Paul Road, namely, a jealousy of outside domination in its affairs. The St. Paul carries this to an extent unexampled in American railroading. It is the only considerable American railroad that runs its own sleeping-cars—an independence that is not only interesting, but to the seasoned traveller appealing. Whether it is the perverseness or the public, or the one-company power in American sleeping-car arrangements, there is an undeniable absence of sympathy between the average traveller and the management

of his sleeping-car. He still endures restrictions that once heated even old John Sherman to the point of rebellion in the United States Senate. The St. Paul Road, running its own sleeping-cars, makes its own regulations strictly, and has been known to discipline a porter for taking a whisk broom instead of a hat brush to a traveller's felt hat: the incident suggests an attention to details that is certainly hopeful.

It cannot be denied that this keeping of all the authority at home affords unlooked-for advantages when aggressive methods became necessary. To get a place in Kansas City and Chicago passenger traffic the St. Paul made a very extensive campaign beginning with the building of an expensive cut-off to get a short line. Advertising, of course, was not overlooked: in newspapers, full back-page advertisements in colors began to appear and the territory was billed far and wide with circus-like energy. Oddly enough, however, the great stroke of the campaign came after these conventional methods had been exhausted. Taking advantage of its own control of its sleeping-cars, the St. Paul, the first summer these trains were run, ordered the usual heavy blankets removed from the sleeping-car berths and white counterpanes substituted. The mere announcement seemed refreshing to summer travellers, and was enough

to gain the coveted prestige; further efforts at publicity have seemed unnecessary.

In like manner the St. Paul keeps its manufacturing at home by building all of its locomotives and freight cars, the policy being to call out new ideas in motive power and rolling stock suited to the road's needs. Readiness to encourage experiments is shown in a struggle, extending now over sixteen years, to perfect the lighting of passenger trains by electricity. Only railroad managers who have undertaken advances of this sort know the record of expense and failure before success is attained. The St. Paul has been not only the first railroad to apply electricity to train-lighting, but the first to bring it to a successful issue, with the result that it now leads all American roads with some three hundred electrically lighted cars: it was also the first Western road to adopt the vestibule car.

There is nothing more indicative of the whole spirit of the Northwest than this aggressive character of Granger railroading. It is, after all, the public which is behind progress, and the advances that are planned daily in Granger line operating departments could never mature were it not for the quick, ambitious people who make the luxuries of other nations their own necessities. The people who live in this Northwest are perhaps the

most alert in our country. Nowhere else are schools both high and primary so jealously advanced; nowhere else is the literature of the day devoured with such zest. Climate and the blending of many bloods seem to have developed extraordinarily the faculties that make for material progress; and transportation in the Northwest is but one instance in which this is surprising. Eastern people are never quite reconciled to the excellence of passenger train equipment that greets them on every strong line beyond Chicago, though there are men who foresaw it a generation ago. When the St. Paul, for example, put on its through service to the Pacific Coast, it recalled to the veteran passenger traffic manager, George H. Daniels, a prophecy he had made concerning this very thing thirty years earlier, and the advance drew from a critic so exacting as himself a tribute of praise.

But the Granger line railroad exploits not only itself but its country. The St. Paul has exploited South Dakota so long and so earnestly that it has come to be looked on by the State administration as a sort of advertising adjunct of its own and is accorded, after a manner, official recognition. Nor are the efforts of railroads in exploiting new country anywhere to be despised. The Rosebud Reservation when thrown open in Dakota offered

2,400 quarter-section farms to homesteaders. Incredible as it may seem, 106,000 applications were registered for these farms, and the applicants, being in most instances heads of families, represented perhaps half a million people. The speedy settlement of the reservation, however, was one of the least benefits to the State. One hundred thousand people who did not secure farms in the allotment were taken into Dakota and made familiar with its resources. Many of these people were drawn from crowded cities and from an unequal struggle for life in the East to a breath of the fresh air and sunshine of the West. Thousands of them, not drawing farms on the reservation, bought other farms, and the State for ten years will feel the benefit of this inpouring of homeseekers from every quarter of the United States.

In this rapid industrial and social movement of the Northwest the St. Paul has its recognized place. It is identified very strictly with its territory. It is one of the few big systems that has kept absolutely aloof from all the big railroad combinations of the last six years; it has not played railroad checkers in any of the games that have been offered to it. Beyond the Missouri River there is much for the St. Paul to think about. The Gulf and the Red River of the

North are already within the field of its vision. What it will do in meeting the situations brought about in the Northwest by the new dispositions in railroad control cannot be said beyond this, that where the traffic is there the St. Paul will be also.

II.—The Chicago and Northwestern

It is said that a Pennsylvania engineer, fishing one summer in the wilds of upper Michigan, strayed from his stream and his guide and lost himself in the woods. It was only after hours of wandering through a trackless wilderness that he emerged, to his amazement, on a railroad right-of-way equipped with heavy double tracks that suggested his own division between Altoona and Pittsburg.

From the depths of a forest never touched by the hand of man he looked on a succession of ore trains thundering past as fast as despatchers could handle them. The roadbed and motive power, showing a physical excellence that he had not dreamed could exist west of the Alleghanies, only increased his bewilderment; nor was his balance restored until assured that what he saw was not an illusion but the

Peninsular Division of the Chicago and Northwestern Railway.

The story is well told—for under these conditions the heavy Northwestern ore trains are run from the Menominee and the Gogebic iron ranges through Michigan forests to the ports of the Great Lakes; and to one unfamiliar with the volume of this extraordinary traffic a sight of it comes with the force of a revelation.

It must not be assumed, however, that iron ore is the backbone of Northwestern traffic: it is a feature, and an important one; but it serves in the Northwestern story chiefly to illustrate the unusual variety of traffic resources enjoyed by a road strong in many directions.

In the country of the Great Lakes lies a land of singular beauty known on the maps of a century ago as the Northwest Territory. It stretches on the north to the Lake of the Woods and the sources of the Mississippi, and, by extension, what is now known as the Northwest includes the States of the fertile western tributaries of the upper Mississippi River.

In the Northwest a climate temperate in its vigour unites with a soil well-nigh inexhaustible in vitality. The north wind sweeps prairies that spread from horizon to horizon and lie like glades among forests so plentiful and so rich that in the

useful woods they have hardly an equal in the service of man. The Northwest is a land of sunshine and green fields, where fulfilment waits unfailingly on promise; it is the home of the white pine and the hard maple, of the basswood and the elm and the oak, of the corn and the wheat and the barley, of the clover and the timothy grass; its rivers, deep and clear, run between high banks; groves shade its summer landscapes, and in the autumn the juices of brown leaves store riches in the soil and stain to wine the cold, swift waters of its brooks.

Frenchmen, three hundred years ago, before other white men had seen it, mapped this vast country to the south and west of what is now called Lake Superior. French explorers were the first to thread its waterways, and French Jesuits under its forest arches set up their altars of boughs, and taught to the Algonquins and the Sioux the faith that Paul preached at Antioch and Augustine brought to Britain.

Where Jacques Marquette baptized the Illinois the tribes are scattered; where the shores of their lake felt the benediction of his tread have arisen great cities—the neophyte and the missionary survive only in statues of bronze. But history, kinder than progress, has preserved in river and lake and strait and bay, in the cities and States of

the Northwest, the names and memories of the blackrobe, the chevalier, and the Indian.

La Salle was at the mouth of the Chicago River in 1679, and eleven years later an English ambassador had reached Wisconsin seeking an alliance with the Miami. In 1682 the great Frenchman set up on the Mississippi the standard of France, and six years afterward Perrot had raised the cross and the lilies on the soil of Minnesota.

But the Hudson Bay Fur Company had already been chartered, and for a hundred years the two most highly civilised nations of Europe bribed, goaded, debauched, and cheated the unfortunate savages of North America in their efforts to obtain the sovereignty of this Northwest empire. In the end the long arm of England prevailed, and the destinies of the Northwest were shaped for a thousand years.

In all of the surprises worked since 1690 in this Northwest wilderness none is more remarkable than that on the least promising site to be selected the industrial capital of the Northwest should be built. The little Chicago River as an Indian waterway seems always to have had part in Northwest history. In 1773, William Murray bought from the Illini Indians a farm that included the stream. Indeed, for five shillings and some mer-

chandise, William purchased a strip of land extending from Chicago to the Mississippi. A small portion of this five-shilling farm would now be worth several billions of dollars.

Murray failed, however, to make good his title, and it was not till 1833 that the United Nation Indians ceded to the United States the last of their lands east of the Mississippi and opened the Northwest definitely to the settlement of whites. So fast did events crowd on one another that only twenty months after the Senate of the United States had ratified this treaty the first railroad—the parent stem of the Chicago and Northwestern—was chartered out of Chicago. Transportation, indeed, was destined to change faster than any other agency the character of the new territory. This Galena and Chicago Union Railroad project languished for ten years, but in 1848 ten miles of the road were actually built, and even so small a beginning brought its significant sequel. The first trip was made over the ten-mile division by the directors and stockholders of the pioneer road November 20. On their return trip to the city they met a farmer hauling to Chicago a load of wheat. What rate the directors made on his business does not appear, but they came somehow to terms, for the wheat was transferred to the observation car and became the first grain ever car-

ried by rail to what was afterward the largest grain market in the world. In the same year the first telegram reached Chicago.

This wagon-load of grain indicated the future basis of the prosperity of the Granger lines. Grain has made the Northwest and its railroads famous, and of the many vigorous transportation systems none has chosen a name more happily appropriate to the territory they serve than the Chicago and Northwestern. Ingenuity can find nothing to add to or take from this title in expressing the idea of the territorial grain empire of the United States, and its industrial capital.

The historical railroad development of the territory follows with simplicity the natural highways of traffic, and these in an early day, even more than at present, converged at Chicago. In consequence, Chicago's first ten miles of railroad ran straight west. A map made in 1861 would show such a line extended across the Mississippi with a system in embryo already shown in additional lines of eighty and one hundred miles running north into Wisconsin. Here already may be seen the bone and essence of the Northwestern system—a trunk line north and a trunk line west; Cedar Rapids a western terminus, Oshkosh a northern. There were at every moment of advancement two objective points in the strategy of

the Northwestern—one, the west, with the Missouri River as an objective point; the other, the north, with the iron and the copper country as a goal—and 1870 found the system with both aims achieved. The Northwestern was the first railroad from the south to reach the rich mineral belt of upper Michigan, and its first seventy miles of track to the Wisconsin State line, built on a gauge six feet wide, makes the effort seem a very early one.

More then two hundred and fifty years ago Jesuit missionaries reported copper on Lake Superior, and the most alert prospecting the world over from that day to this has never uncovered beds of native copper approaching in richness and extent the Lake Superior deposits; nor have mineralogists satisfactorily determined why Nature made there the immense deposits so geologically unique. Though Montana and Arizona have become immense producers of copper, their mineral, being in the usual form of copper ore, requires for reduction an intricate and long-drawn treatment. Lake Superior copper is not only simply mined but it is noted for its toughness and its exceptional conductivity. For electric currents it is invaluable, and it lies under Lake Superior rock in sheets as thinly drawn as gold-leaf and in masses weighing 500 tons that go piecemeal to

the smelters and never pass through the stamp mill at all. The elder Agassiz early directed attention to the unexampled richness of Lake Superior copper deposits. So closely was he engaged in the early modern development of these fields, and so intimate are the association of discovery and the business instinct in America, that the great mine of the north country, the Calumet and Hecla, which boasts a shaft 4,900 feet deep and the finest mining machinery in the world, has always been largely owned by Boston investors.

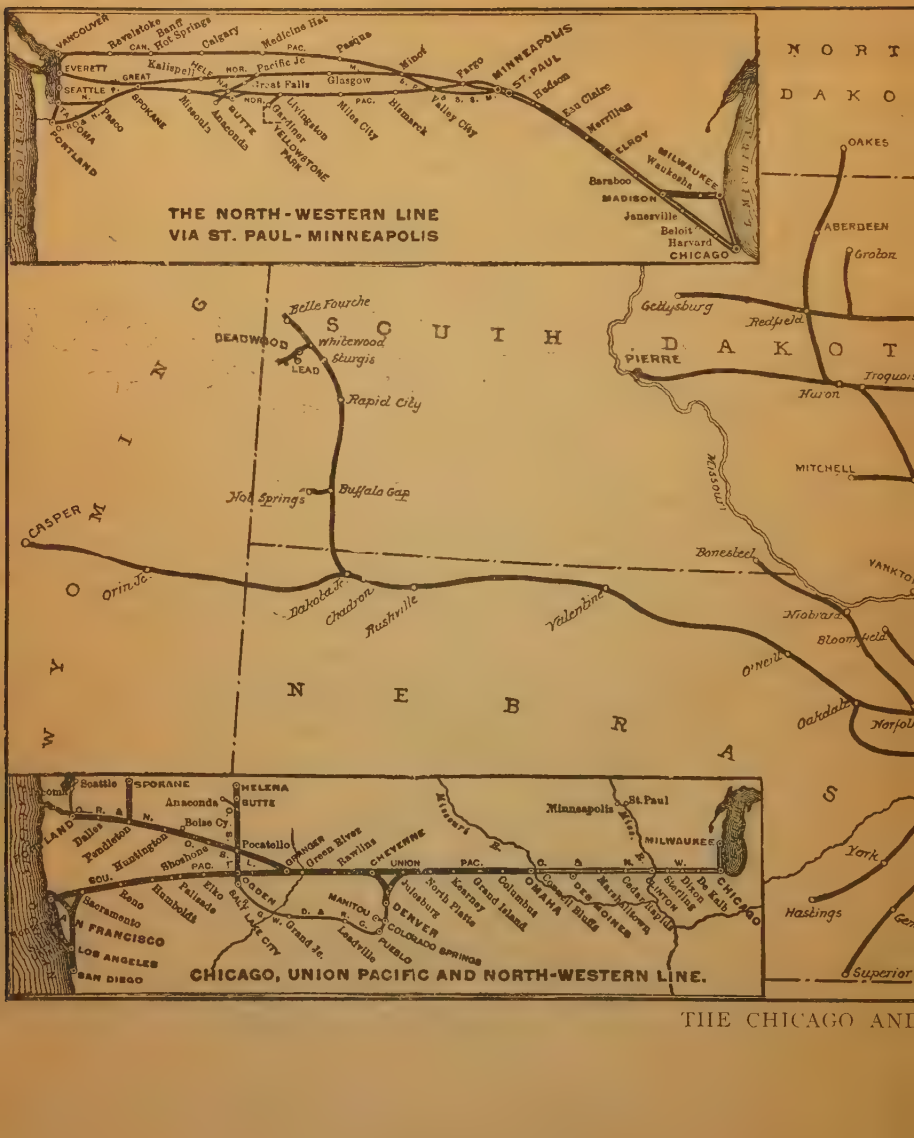
Iron, however, from a traffic viewpoint, is incomparably more valuable to the railroad than copper, and the Lake Superior iron mines are the richest in the world; not alone because their ores are lowest in refractory elements and highest in metallic iron, but because nowhere else in the world have such large beds of merchantable ores been exposed. To these advantages the Lake Superior country adds a climate that allows the continuous operation of all mines with underground workings. Less than this would have made Lake Superior strong as a mineral region in the useful metals; as it is, it stands pre-eminent; nowhere has it even an approaching rival. The first bar of Lake Superior iron was drawn through a blacksmith's forge so late as 1846, and at

Carp River blooms were made a little later, but the first real shipments of ore were started for the lower lake ports in 1856. Last year the Lake Superior country produced 24,000,000 tons of iron ore; indeed, the production of the Lake Superior region is one-third that of all the world.

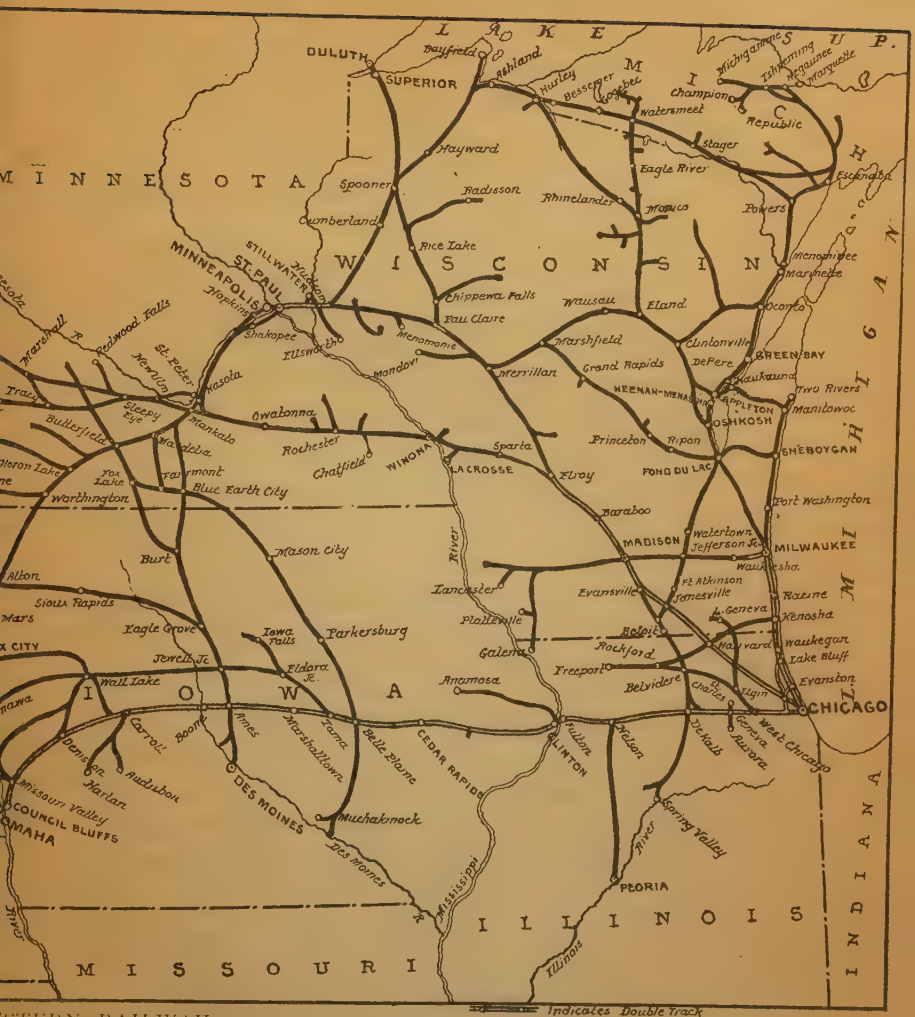
In this territory lies one of the strongest arms of the Northwestern system. First in the field, the railroad has intrenched itself in a way that astonishes those not familiar with the enormous traffic possibilities of the Peninsular Division. The Escanaba ore docks are the largest in existence, and at Ashland the Northwestern has a record of having loaded 5,000 tons of iron ore into a steamer in one hour. The experience of the company in reaching this country has been one of especial good fortune. Here were no long and profitless desert wastes to cross to reach a traffic goal. Local business from the start has been of good volume. Wisconsin is a portion of that paradise that Frenchmen discovered when they penetrated the Green Bay. Fishermen and hunters still flock to Wisconsin, which, together with Minnesota, is in effect a national game reserve. Wisconsin is the land of barley, small grain, and the dairy. Its butter and cheese help to feed Europe. Divided by an east and west line, the

north half of the State has for half a century been a reserve of timber which even yet is not wholly exhausted, and its store of hard woods is still large. Men have said that with its timber exhausted Northern Wisconsin would be worthless, but those who know Wisconsin best predict that within fifty years Northern Wisconsin will be the more valuable half of the State. Where the pine stood the farmer has gone in. The tamarack swamps are drained, and the dry, hardwood regions are being cleared; steers have been turned into the brush and the clearings, and the dairyman has discovered in Northern Wisconsin an unsurpassed field for his business. It has been pointed out to him that the most nutritious of grasses, the coolest of waters, and the most temperate of summer suns—essentials for the production of milks that are the base of fine flavoured cheeses—are the heritage of Northern Wisconsin, and the Dean of the College of Agriculture at Madison has reminded Wisconsin farmers that solely in these climatic conditions they have a possession as precious as the gold of Colorado or the coal of Pennsylvania. Wisconsin is like a mine from which new treasures are continually drawn.

In 1867 the Union Pacific, after overcoming stupendous difficulties of construction, had reached Cheyenne and was ready to begin its crowning



THE CHICAGO AND



STERN RAILWAY.

task of scaling the Rockies. The Northwestern pushed its rails, in November, 1867, into Council Bluffs and began pouring material into the Union Pacific yards. Eighteen months later, under the impulse of quickened construction, the Central and the Union track-layers met at Promontory, Utah, and the Overland railroad line from New York to San Francisco was made complete.

The results to Chicago and the Northwest were immediate. The current of transcontinental travel set across the territory to the fast growing city on the shores of Lake Michigan. Iowa, already touched by the magic of railroad enterprise, grew with astonishing rapidity. Indeed, the development of the upper Mississippi Valley and the opening of the wheat fields and the corn belt between 1865 and 1875 have hardly a parallel in the story of the nation.

The Chicago and Northwestern, however, with its early aims achieved, found itself only on the threshold of the anxieties of its career. Lying immediately west of the Northwestern lines at the Missouri River was a State whose traffic possibilities could no longer be ignored. Nebraska is remarkable in many ways. Much larger than England and Wales, and larger than all New England, Nebraska has not only a million people but a million of cows, and the cows are increasing

rather faster than the people. Moreover, in Nebraska every one farms. Railroad managers, as well as railroad lawyers, farm. Bankers farm and physicians farm. By far the greatest man that Nebraska has ever numbered among her sons, J. Sterling Morton, farmed. Even her politicians not only farm but from the pleasant leisure of successful retirement find time like Temple to write thoughtful essays on the attractions of country life. An abundance of nutritious grasses that cure on the ground cover the plains of Nebraska, and, together with a climate that has few drawbacks and many advantages, make Nebraska a great stock-raising country. Dairying naturally follows. Nebraska lays a claim to the greatest number of native pasture and hay grasses of any State, and proves its assertions, in part, by producing the finest feeding cattle. In the eastern portion of the State are 20,000,000 acres of high-class farm lands, while in the western are 29,000,000 acres of grazing and hay lands. Again, it is difficult to say precisely where the line divides, for down in the southwest corner of the State, in the winter wheat country, the banner wheat station on the Burlington road lies on the one hundredth meridian. Due north of this, 200 miles, a little northwestern town, Newport, ships more hay than is marketed from any one other point in the world.

Nebraska, too, though young in dairying, has the largest creamery in the world, as well as the terminals and headquarters of twenty railroad systems. Nebraska is proud among sister States of its smallest percentage of illiteracy, and its soil will grow everything from alfalfa and the sugar beet to chicory and corn. The small grains, notably winter wheat, are Nebraskan products; but her most valuable possession is the soil and climate that have yielded in a single year 250,000,000 bushels of corn.

In the support of human and animal life no cereal crop is so valuable to mankind as corn, and those scientists who place at 1,000 the total worth of cereals to the world, accord to corn 266 points, or more than one quarter of the whole percentage.

Moreover, the lands of Nebraska lie in a belt that has almost a natural monopoly in corn-raising. New small grain districts are continually being discovered the world over. Corn can be raised in this district only, famous as the corn belt of the United States, and the prosperity of a territory such as this is indicated in the single statement that one of its States, Iowa, has more banks than any State in the Union. Nebraska reflects its extraordinary corn strength in stock-feeding; besides its milch cows, it counted, on January 1st, nearly two and

one-half million head of other cattle. The State has, too, the most unlooked-for and pleasant side-lines of activity. Besides its creditable Beet Sugar industry Nebraska is an unrivalled seed State: it supplies Georgia with its famed water-melon seed and Maine with the seed for its sugar corn. Of the vine and sweet-corn seeds, Nebraska supplies more than all other States combined.

This great trans-Missouri State was, in a word, one which in Northwestern territorial strategy could not be overlooked; and beyond Nebraska there were further prizes. On the extreme western boundary of South Dakota lies a strange geological upheaval known as the Black Hills. It is one of the three great gold districts of the country. The Black Hills, indeed, have taken to themselves, seemingly without dispute, the title of being the richest hundred miles square on the face of the earth. They can already lay claim to the largest existing gold mine, and in reality only a beginning has been made in exposing their mineral wealth. Estimates based on Government reports and surveys place the value of the unmined gold and silver at a billion of dollars. The ores of the Homestake mine lie in bodies so large that a century will hardly suffice to work them out, and the Homestake has already sent to the mints $90,000,000 in gold bullion. It crushes

3,000 tons of ore every twenty-four hours, and its working, together with that of other gold properties, supports two large and wealthy cities—Deadwood and Lead—in the most picturesque corner of the United States. In this far Northwest the Black Hills offer a climate so tempting that many people live there for its excellence, and the Hot Springs of the Black Hills draw visitors from every quarter.

Skirting the Black Hills again on the south the extreme western terminus of the Northwestern penetrates Wyoming, a mountain country with all the rugged strength of the American Rockies. From Wyoming and Montana come the range cattle and the mountain valleys are filled with sheep. Montana supplies a tenth of our wool and Wyoming follows very closely in production. Along highways that stretch hundreds of miles and are strung with telephone wires, cattle on hoof are driven to Casper and shipped to the packing centres. The country is most interesting. Here are the fountain-heads of the great Missouri River, and beyond, the natural wonders of the landscape have been preserved by the Government in its National park. Across Wyoming to the sources of the Wind River, over the continental divide and down to Jackson Lake, one may ride a bicycle or a pony for 300 miles into

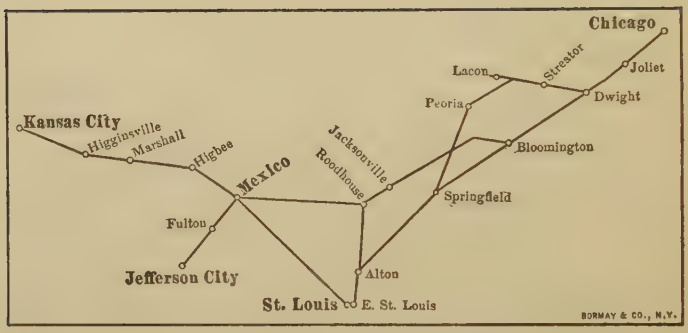
the valley of the Yellowstone. The Wyoming sky is never clouded nor is its summer ever oppressive. In this thin, clear mountain air rest knits into vigour the sinews of the jaded city man and charges his storage batteries with sunshine. Wyoming is a Pennsylvania in mineral wealth, but its resources have scarcely been exploited.

The map of recent railroad development—for the Northwestern has built 1,300 miles of track west of the Missouri River—follows clearly the very earliest movement of Western railroading. The railroads have made the Northwest, and the Northwest in turn has done handsomely for its railroads.

In this transcontinental advance the Granger lines have kept their link one of the strongest in the chain. When the Northwestern opened the first double-tracked gateway from Chicago to the Missouri River it was providing, as every prudent management must, not alone for present but for future needs. A system able to count among its traffic mines cities like Chicago, Milwaukee, Duluth, Superior, St. Paul, Minneapolis, Sioux City, Des Moines, Omaha, Lincoln, Deadwood, and Lead is fortunate, but must always be alert. Northwestern management has never, since the system really found itself, failed to meet the needs

of its territory. If it is closely in touch with its own people—the shippers along its lines—it is because no cause has ever been given them to feel that their interests were last to be considered in the Northwestern councils.

THE REBUILDING OF AN AMERICAN RAILROAD



THE CHICAGO AND ALTON RAILWAY

THE REBUILDING OF AN AMERICAN RAILROAD

In American railroad management there is one phase of railroad building of which little, save in a general way, is known—the phase in which a successful railroad operator observing neglected possibilities in another line, acquires it, rips it to pieces, and from the fragments builds up what is practically a new railroad.

An Eastern proverb tells us that many pass; one sees. The seeing man, in such an instance, is the man that knows, just a bit better than his fellows, railroad possibilities. This man, finding the opportunity, enlists the capital, buys a railroad at what may seem to the owners and to the public a very high price, and proceeds to demonstrate that the price is in reality a low one, in this: that where the property had with difficulty earned one dollar it could readily be made to earn two.

In this demonstration the buyer of the railroad faces his real problem—that of developing in his purchase a greater earning power than it has thus far shown, and the work is not unlike that of a

man who buys an armory built for the manufacture of the Springfield musket, and undertakes to transform it into a plant capable of turning out a modern rapid-fire gun.

As an example in an extraordinary degree of what may be done in the rebuilding of an American railroad I have chosen the story of a line, the Chicago and Alton Railway, with terminals in three great inland American cities—cities that show every characteristic of the national activity and achievement.

There are other reasons for citing this particular example of the possibilities in railroad rebuilding. The case is one which affords in the first place very sharp contrasts between the old condition and the new. Moreover, being a fast passenger line, the reconstruction has called for the very highest refinements in track excellence and equipment; and as a competitor for a heavy freight traffic, in a territory where American railroads have for a long time put forth the most efficient efforts to do business inexpensively, this road required the highest order of resource in management to put it ahead of its neighbours.

For many years the road has enjoyed a great reputation. The railroad world as well as the travelling public believed in it. The duty of informing the surprised operating department that

they had, in point of fact, no road at all, fell upon the new president whose task was to make the railroad wholly over. The old staff then learned to their consternation that their track was an excuse, their motive power hardly more than a reminiscence, their equipment a curio, and their reputation a fiction.

The road, one of the first built out of Chicago, was one embodying the most interesting historical association; it had run the first sleeping-car ever offered to the public in the world; it had run the first chair-car ever built and the first dining-car.

But in meeting competition, history is not resource. The tracks, built in an early day, followed closely the configuration of the country. If a plough was used on the original right-of-way, it was beyond doubt a shallow plough, and the grades reflected very faithfully the hills and the hollows of the prairie. The bridges and the culverts were chiefly of wood, and such ballast as had been used was the spoil of convenient gravel banks: a little stone, some slag—all worn in the service. One pet the road had: a graceful steel bridge of enormous proportions, costing half a million dollars and spanning the Missouri River. This, again, was of rare historic interest, for it must always bear the distinction of having been the first steel bridge ever built in the world. But in the rebuilding of

the system, so unique a claim to distinction could not save it, and to the horror of the operating department the five-hundred-thousand-dollar bridge went to the scrap. The fact is, all these picturesque features of the pioneer line had had their day. That which yesterday was a railroad marvel becomes to-morrow a curiosity.

The first order to the engineering department of the division where the traffic converges toward Chicago called for a maximum of $\frac{3}{10}$ per cent. grades—sixteen feet to the mile. Seventy-pound rails went to branches and to passing tracks, and on the main line eighty-pound rails were called for from end to end of the system. While steam shovels were tearing down the Illinois hills, bridge engineers were ripping out trestles and culverts, and the false work was going in at the Missouri River for the new bridge, a million-dollar steel bridge, capable of carrying the huge locomotives and the fifty-five-ton capacity cars that were being built for the new owners. To eliminate curvature and reduce gradients the original right-of-way was in places wholly abandoned.

All this was done, of necessity, without suspending regular traffic. While the bridges were being rebuilt the new motive power and car-equipment were under way. The heaviest freight engines previously owned had been of fifty-five tons

and were capable, in condition, of hauling thirty cars of twenty-five tons each; but the engines had been allowed to deteriorate until not above eighty per cent. of that capacity could be obtained. The new engines of the consolidation type for freight traffic weigh one hundred and sixty-five tons and haul one hundred freight cars. The passenger power consisted of forty to fifty ton engines capable of hauling five to seven of the coaches of their day at high speed. Such engines have been replaced by modern engines of one hundred and thirty-five tons, while for especially heavy passenger service, of which the road has more than any line in this territory, exceptionally large engines have been provided, recent additions including the two most powerful express passenger engines in the world. The largest passenger engine in use on the Alton during the World's Fair in Chicago, caught by a photographer beside one of the engines used during the St. Louis World's Fair, would show strikingly the advance in motive power during the interval that has elapsed between two international expositions.

In freight-car equipment, twenty and twenty-five ton capacity wooden gondola cars were replaced by fifty-five-ton capacity steel gondolas, and the proportion of the weight of car to load

was reduced one-third at a stroke. Moreover, the use of so high-capacity cars has reduced train friction to an equal degree. Acquiring a line that had always enjoyed a heavy passenger traffic, the new owners, where they had found fifty-feet coaches, built coaches seventy feet long, and by ingeniously installing seats of a modern type as well as more comfortable than those of earlier models, they have succeeded in accommodating in the new cars twice the number of passengers provided for in the old. In the cars of to-day every feature of equipment helps to minimise the fatigue of travel. Even local travel is tempted by all the comforts that can be offered to invite a day's shopping in the city; wide vestibules have been provided for even the least ostentatious of the daily trains, and so rigid are the present rules that the operating department will not receive from any foreign line a passenger car without vestibules. New ideas, too, have been so far encouraged that the road which ran the first dining-car in the world clings to its prestige of offering not only every variety of dining and café cars, but has recently evolved a grill-room car, the very name of which appeals seductively to luxury-loving Americans.

Of the important problems, however, that confront the railway traffic manager, the most serious

are those concerned with terminal facilities, and if these are serious for passenger business, for freight traffic they are vital; the railroads that are first to enter and to secure terminals in a great city are the envy and despair of all newcomers.

With every year the position of the roads having the oldest, which usually means the best, terminals becomes more nearly impregnable, and the instances are many in which one road holds by a grip stronger than that of the most conceivably powerful monetary combination the traffic of a given district in a large city—at times of an entire city, as has been seen in Pittsburg, for example, or in San Francisco. If its siding tracks are in, its yards established, and public streets afterward cut off all possibilities of new roads entering, the older road has the most complete of monopolies. No more impressive lesson in the science of American railroading has ever been supplied than in a consideration of the policy pursued by the early owners of the railroad here discussed. Questioned as to what most struck them in the conditions prevailing on the system they had determined to acquire, the rebuilders replied, as one man and in precisely these words: "An absolute lack of terminal facilities." The answer illustrated better than pages of comment the difference between new and old ideas in American railway manage-

ment. It is hardly enough to say that in this instance the old management was a capable and a brainy one. It was noted in the whole railway world for its clear-cut, unswerving, money-making ability. The policy of keeping out of debt was closely followed, and the earnings went in an ever-swelling stream straight to the dividend account.

It was not until the revolution that has marked the last ten years in American railroading took place, and not until buyers began to look over the railroad field for new opportunities, that the lack of foresight in such methods of management became apparent. This road, enjoying one of the earliest entrances into Chicago, had had its pick of terminal facilities such as would now be precious beyond dreams.

Not the offer to any railroad of unlimited traffic tonnage, nor the possession of the most perfect possible equipment to handle it, could equal in value to-day really adequate Chicago terminals. Yet, twenty-five years ago so slight was the value set even by prudent managers on such facilities that the first owners of this road sold a one-half interest in their Chicago terminals to a powerful Eastern connection and, more incredible still, surrendered in the transfer their own control of them. We have biblical authority for the story that Esau

sold his birthright for a mess of pottage. But Esau could, at least, have pleaded urgency—he needed the soup; the folly of a railroad's parting with its birthright in the very best of Chicago terminals, to distribute among stockholders their price in seven and eight per cent. dividends, was reserved for our own day and generation.

In the next most important city on the system, St. Louis, the road never took title to a foot of terminals, its facilities being wholly rented; worse still, it acquired no interest in the company controlling them. In the third great commercial centre entered, Kansas City, terminals ordinarily good when acquired were found to be for to-day not only insufficient but unconnected by ownership with the main line. What such mistakes on the system have since cost, the financial interests now in control do not state; it is enough that they have been corrected. The truth is, the buyers in such a case have no ground to complain. But there is a third great and undefined party to all questions of railroad management, namely, the public, or that portion of the public which is dependent on a particular road for its transportation facilities.

The Alton being once acquired, it became the policy of the new owners to increase the facilities of the public along their line for doing business.

A single instance of what has been accomplished in this line is so striking that it will serve for all comment on the point. Five years ago this road had no coal traffic. Its tracks have always covered the richest coal-fields in the West; yet it hauled no coal. To ride over the road to-day and to pass, at the car windows, hundreds and hundreds of huge, steel gondola cars loaded with bright, newly mined coal in lump and block and to see other hundreds of such cars lying about division and terminal yards would make the statement difficult to credit. Yet this enormous and really extraordinary development of freight traffic in so few years has been the immediate result of merely providing the road with adequate cars, engines, and yards to care for the traffic, and the reducing of grades and curvature sufficiently to enable the road to make a rate on the business that would protect the local shipper of coal in competitive markets. So rapid and so constant has been the success of endeavours in this one direction that on this road during the present year two of the largest mines in Illinois are being opened—mines equipped with modern washeries and with a producing capacity each of two thousand tons a day. In five years this railroad, beginning with nothing, has come to take second place in tonnage records from Western coal-fields, and during the great

hard-coal strike its daily contribution of two hundred cars of soft coal to Chicago helped to avert an actual famine in the great manufacturing centre. Another decisive feature of management obtains in the care of this newly fostered coal traffic. The road has made it a policy to open no mines of its own, and when there is a shortage of cars the suspicious shipper knows, at least, that the railroad he is dependent on for his daily bread is not providing its own mines with equipment when he himself is unable to get what he needs. The point is a slight one, but good management rests on details; it rests also, not alone in keeping faith with the public, but in seeming to keep faith.

What it means to make over a railroad for such modern traffic requirements is reflected sharply in the work put upon the construction department. Working out of Chicago, track elevation was pushed until every railroad grade crossing from the terminal station to the suburban yards has been eliminated. The grades receiving the heaviest of the traffic as it centred toward Chicago were reduced until they gave the rebuilt road the lowest maximum grade of any road entering Chicago from the Western coal-fields. At the very outset the work of double-tracking was begun; to provide for heavy cars and engines, heavier rails have been spread south and west,

until to-day over one-half the total mileage of the entire system shows new steel. The work falling on the bridge department was continuous and exacting. While shops were being enlarged, engine-houses rebuilt, and turn-tables lengthened, the track elevation at Chicago called unceasingly for viaducts, and the traffic conditions everywhere on the system demanded new bridges for the motive power. Yet, so well does American engineering meet American exactions that a heavy traffic was maintained without serious interruption while on the system practically all new bridges were being put in. Better conception of the undertaking may be had when it is considered that on less than a thousand miles of trackage three hundred and eighteen bridges were replaced within four years. Of these, one hundred and fourteen bridges were wholly done away with by the cast-iron pipe and the concrete arch—the progress in the use of concrete work being one of the most striking features of recent bridge construction. But besides the great bridge across the Missouri and four solid-floor creosoted trestles, one hundred and twenty-two steel bridges also were installed.

The elimination of curvature, pushed till the maximum had been reduced to four degrees, is still in progress, and so far has bad curvature been taken care of that an engineman familiar

with a division five years ago would hardly recognise the right-of-way in daylight. Long restful stretches of straight track have been developed until there are now on the system many tangents of from fifteen to twenty miles; there is at least one tangent of twenty-nine miles and one extraordinary stretch of forty-five miles of track, straight as an arrow's flight. Even when the curve is reached, the traveller in the Pullman is deceived. The track dip, or superelevation, at a curve is for speed purposes always a compromise. Passenger trains take curves at a speed of from seventy to eighty miles an hour, but to elevate for such a speed would mean too much resistance for the heavy freight trains taking the same curves at twenty miles an hour. Curves are therefore elevated for a speed of sixty miles an hour, and a higher speed means a slight shock to a Pullman train.

So clever, however, have the construction engineers become that even this difficulty has been obviated. Ingenious easement curves, or "spirals," have been introduced, and they heel a fast train so gradually to the dip needed for the radius that the lurching is wholly avoided, and the traveller can be sent around a curve without knowing it, the effect being like riding a continuous tangent. Such devices for the making

of passenger travel safe and easy are within the reach of any railroad; it is their expense that keeps them from being generally adopted. Unless a road caters to a large passenger traffic the management will not stand for such estimates.

In doing away in modern construction with curves a more notable instance of what is possible than that shown in alignment near Streator, Illinois, would be hard to find. Here, directly beside the new stretch of straight track, the old roundabout track, the long fill, and a spindling steel bridge, such as many roads would be proud of, may be seen lying wholly abandoned. Within half a mile a perfect succession of reverse curves have been eliminated, and to-day the new line has resolved itself very simply into a long tangent with a curve at each end.

The initial cost often deters railroads from radical efforts to rid themselves of expensive blunders such as these in original construction. There are, however, unexpected compensations. In this instance, hardly had the change of track been made before negotiations were under way to sell intact to a trolley-line, building hard by, the abandoned right-of-way, the big fill, and the long bridge. The buying and selling of second-hand locomotives, second-hand cars, and second-hand rails is a profitable business among jobbers in rail-

road junk; worn-out rock ballast even now finds ready purchasers among trolley-lines; and we may yet see among enterprising scrap-dealers announcements of special sales of discarded steel bridges and bargain days in second-hand curves.

Mention has been made of ballast-floor bridges, and the phrase is attractive. It is hard to believe that the idea is quite new, and to realise how much the ballast-floor bridge contributes in comfort and safety to railway travel. The ballast-floor carries the through train noiselessly over the long, heavy plate-girder bridge and subdues the roaring viaduct into a span of peace and quiet for the nerve-worn suburbanite.

The construction is really so simple and the results so extraordinary that it is a mystery the ballast-floor bridge should not have been used long ago. Yet, the railroad whose rebuilding we have followed was the first steam railroad to apply a ballast-floor to steel bridges and to regular track-work. The two great merits of the idea are, first, safety; if a train leaves the track the bridge ties bedded in standard rock-ballast cannot be bunched. Bunching the ties under the wheels of a derailed engine means the weakening of the bridge structure, indeed, its possible collapse under a wreck. More than this, the ballast-floor does entirely away with the booming vibration

under the passenger car, and the commuter whose nerves are still racked night and morning by viaducts may know that his railroad has not reached the ballast-floor stage and may protest accordingly. A creosoted pine floor of 8 x 8 timbers is laid on the steel girders of any bridge structure and on this rock-ballast is dumped, the ties being laid in the ballast in the usual way. Neither above nor below the bridge is there any material vibration, and the resounding terrors of a steel-plate floor are no more; applied to the systems of elevated roads in city streets the ballast-floor would solve the terrible noise problem at once. The thorough ballasting of a railroad is in itself a serious undertaking and on the Alton a system of regular inspection, supplemented by annual competitive prizes for excellence in maintenance, keeps alive at all times a keen interest in the work among section foremen and track supervisors.

With the engineering department thus busy, the operating department found itself overwhelmed with problems of transportation. The mere change of train-running on the double track from the old-fashioned left-hand way to the new right-hand way, meant the changing of every switch to secure trailing instead of facing points and the rebuilding of all interlocking plants. To

strengthen the work of the operating department, the railroad world has been drawn upon for the most effective safety devices in the operation of trains. Long stretches of track, in one instance covering a distance of sixty-five miles, are provided with continuous electric signals which protect moving trains, stations, grades, and curves. Previously to the rebuilding there were comparatively few interlocking signals on the whole line to protect railroad grade crossings.

The greatest obstacle found by the rebuilders in the economical operating of the motive power was a uniformly bad water-supply. Hard water continually ruined the boilers. With the determination to check this enormous waste of maintenance, pumping stations were installed, reservoirs impounded, and soft water secured at all costs for the boilers. But to the public the most interesting feature about such efforts is to learn of the sometimes unexpected results that follow them. A large reservoir impounded for water-supply, near a prosperous Illinois town, incidentally transformed a series of gullies and hollows into a beautiful lake. The townspeople were quick to note the change in a landscape that had been for generations commonplace and uninteresting. They asked permission to stock the new sheet of water with black bass, and when they had fish in plenty

they wanted a country club. The railroad people gave them a lease of the lands surrounding the lake, and to-day the entire tract has been made into a park with the lake for its centre; from a knoll a shady club-house overlooks the water. It would be difficult to convince the people of this town that primitive ideas in railroading should be adhered to; they have become believers in progress.

Side by side with the reduction of waste in engine maintenance has gone effort along every line in the reduction of operating expenses. Feeding the engine, for example, has been reduced to so fine a point that a locomotive may take water, coal, and sand all at the same moment. Below the engine as it stands the cinders may be dumped into steel buggies. From these they are dumped in turn, automatically, into conveyers that load them on dump cars, and the cars spread them where wanted on the track; not once are they touched by manual labour. Such a coaling station, supporting a seventy-ton bin over a scale and handling every day two hundred tons of coal and one hundred and fifty thousand gallons of water, besides sand and cinders, is operated by only two men, one for day and one for night.

To secure the working force for the operation of the road, employment bureaus are maintained

which draw from the sons of farmers and shippers along the line. It is a pioneer idea among railroads, but its wisdom is obvious. Of equal importance, and also unique, is a railway instruction school conducted on cars fitted for the purpose. In this school every switchman, operator, trainman, and engineman takes a course. There are classes in rules, in orders, and in signals, and, while working to higher positions in the service, subordinates attend them, final examinations being held for promotion. By means of the stereopticon, signals are shown in the car, and the pictures include a complete panorama of trains of every class, of trackage of every description, and of the semaphore and interlocking plants of the entire system. Photography, indeed, has become so important an adjunct in the work of the new kind of railway management that an official photographer is a part of the operating department of the new road.

Photography of this systematised description serves admirably to supply newspaper editors with timely illustrations and affords material for write-ups. As a means of adjustment in cases of accident and personal injury the photograph is of especial value. If at any time an officer is too busy to go out in person to see any feature of a road, he may send the photographer for a view

of it. For personal injuries, surgical aids have not been overlooked, and every train is provided with a chest that includes the chief medicines and certain instruments for use in accidents; in addition, each car has its first-aid packet.

The entire point of view is, in railway affairs, quite modern. It is not that these ideas are all of them novel, but that together they represent that which is good in the best railroad management of to-day.

THE FIRST TRANSCONTINENTAL RAILROAD

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In history we have the record of every day but yesterday, and of every generation but the last. Our first transcontinental railroad was begun only forty years ago; yet as compared with what we know of its story our information concerning the Boston Tea Party is precise. Possibly this is a tribute to the moral over the material; possibly the blinding aurora of the Civil War still so plays on the retina of our memories as to obscure all lesser events on that horizon; at all events, when recently an American public man was asked for literature concerning the history of this railroad building he was at a loss satisfactorily to refer to any.

Even in looking back into the story, it is difficult to realise that the building of a railroad to the Pacific Coast had been publicly proposed before New England had a mile of railroad; and that as far back as 1840 the Pacific Railroad project had already become popular and was timely matter with newspaper and magazine editors.

But by 1845 the subject had taken so firm a hold on popular fancy that an ingenious memorialist of Congress, Robert Mills, in advocating the building of a transcontinental highway for automobiles—"steam-carriages," he termed them—modestly claimed to have advanced the idea of a Pacific Railroad in 1819. This the historians will not allow;* it is certain, however, that in 1840 dispute had already arisen as to the honour of having first proposed a transcontinental line.

The seeds thus sown in the thirties ripened in the succeeding decade into an agitation that became national. A New York merchant surrendered so completely to the fascination of the Pacific Road idea that he gave his life and his fortune to efforts to arouse public opinion on the subject and to move Congress to action. It was not that he had aim of personal aggrandisement, for he proposed to assume the construction and general superintendence of the road at a salary so nominal as $4,000 a year; he was primarily moved by the glorious national possibilities of his enterprise, and it must still move the reader of the long and somewhat tedious story of the Pacific Road project to picture Asa Whitney, towering in breadth and strength above all early

* The Union Pacific Railway, John P. Davis, Chicago, 1894.

promoters, his illusions still unshattered, but the span of his life exhausted, keeping a dairy in the city of Washington, and selling milk to mitigate the poverty of his declining years.

Thomas H. Benton, in a burst of public eloquence, proposed in 1849 that the Pacific line when built be adorned with a statue of Columbus hewn from a granite peak of the Rockies, the mountain itself its massive pedestal, with an outstretched arm pointing India to the westbound passenger. Benton's idea was never carried out, but in the Black Hills, more than eight thousand feet above the level of the sea, stands a great cairn overlooking the highest point at which the first transcontinental road crosses the Rockies. A newer track alignment has left this early monument at some distance from the present route, and though at one point a glimpse of it may still be had from the car window, it is now some hundreds of feet above the railroad summit. It com. memorates the energy and perseverance of two men to whom chiefly is due the credit for the building of the Union Pacific. Some time, perhaps, beside the monument to Oakes and Oliver Ames a more modest memorial may rise to the memory of poor Asa Whitney, who surrendered his life and fortune to an idea because to him it was a national and a glorious one.

In truth, there never has been in American industrial achievement, and there never again can be so widespread and stirring a public sentiment as that which called for the building of a Pacific Railroad. We can never again be poor; we can never again be only vaguely conscious of a Samson-like national strength and youthfully impatient to test it. We have tested our strength since then in too many ways; possibly we are not quite proud of all of them. Nor can we ever return to a public sentiment that knows no jealousy of extraordinary riches, and as to industrial enterprises we have been surfeited; every day we taste of new ones with palates more jaded.

It was otherwise then. The great plains were the home of the Indian and the buffalo. Pike's Peak was a watchword, the Rocky Mountains a dream, and California a fever when national thought crystallised into a demand for the first Pacific Road. The idea took hold of men as powerful as Webster, as sagacious as Lincoln, as cold as Jefferson Davis, as dramatic as Sumner, and as politic as Buchanan. Douglas and Benton in their day lent to it their eloquence. The ten years that led up to the Civil War saw the project discussed by each succeeding Congress with an earnestness and attention second only to that expended on the slavery question. Indeed, the

railroad matter as soon as it became tangible became political, and divided men into alignment of suspicion and resentment, as the Missouri Compromise divided them. But it forced recommendations from succeeding Presidents in annual messages for years, and when the young Republican Party found itself for the first time in power the Pacific Road project enlisted the aggressiveness of men so resourceful and dominating as Thaddeus Stevens, John Sherman, and Henry Winter Davis. The matter got before the Twenty-eighth Congress in 1845 in the form of Asa Whitney's memorial, and from that time forth for fifty years it engaged Congressional attention in some form during nearly every session. Davis, the historian of the Union Pacific, notes that ten years before a Pacific Road bill was finally passed, the Senate of the Thirty-second Congress was giving more time to the subject than to any other topic of legislation. In 1853 the project got into its first Presidential message; the Thirty-second Congress gave it its first special committee, and national appropriations already made put into the field corps of engineers whose survey reports filled eleven large volumes.

During all these years of the early agitation and up to 1861 there was no real chance for a Pacific Railway bill to pass Congress. All parties agreed

that such a road should be built, but where? The South wanted a southern route, and the North a northern route, and these greater interests were in turn split into minor interests. There were at different periods a New York-Chicago interest indorsed by Seward, a St. Louis interest championed by Benton, a Memphis interest backed by Arkansas and Tennessee, a Charleston interest urged by Gadsden, and a nominal Texas interest upheld by Sam Houston. The struggle over the eastern terminus or termini of the road —for compromise measures at times proposed no fewer than three lines with six termini—might have gone on another twenty years had not the guns at Sumter relieved the situation of its most serious complications.

The Republican Party had, in its first national platform, committed itself to Pacific Railway legislation, and the Democratic platforms of 1856 and 1860 echoed pledges of friendliness to the project. But when Congress assembled in July, 1861, there were many vacant seats. The small but alert Southern element that had opposed Pacific legislation in every form was absent, as well as those larger Southern interests that had fought for a Pacific Road south of the thirty-fifth parallel. The shock and stress of the Civil War had incalculably strengthened the chances for Federal action,

and the discussion in the war Congress lost at once its wordy aspect of earlier years. That form of legislative inactivity known as side-stepping was plainly at an end. There were left but two strong Pacific Railway interests, and of these the more powerful was backed by New York, New England, and Chicago interests, which stood for a line on the forty-first parallel. Seward, indeed, had said in debate ten years before, "Make a route across the continent wherever you please, there will be but two terminals to that road, one at New York, the other at San Francisco." Moreover, Chicago was already pushing west with its roads to the Missouri River, and William B. Ogden, the founder of the Chicago and Northwestern System, stood with the New York interests against a Northern Pacific route. He was already building the Northwestern westward from Chicago, and when the Pacific Railroad bill of 1862 passed Congress, the contest between Chicago and St. Louis as to which should secure the main line had been won by the former in the provision that the initial eastern point of the new line should be at a point on the 100th meridian, "between the south margin of the valley of the Republican River and the north margin of the valley of the Platte River, in the Territory of Nebraska"; and the final bill of 1864 confirmed this location.

The principal eastern terminus was given to Omaha, in a provision that, of several branches provided for east of this point, the Iowa branch should be built to the initial point on the 100th meridian, from "a point on the western boundary of the State of Iowa to be fixed by the President of the United States"; and Abraham Lincoln fixed the point within the limits of the township in Iowa opposite the town of Omaha, in Nebraska, and afterward, "east of, and opposite to, the East Line of Section Ten." In the end the legal terminus was fixed by the Supreme Court of the United States on the Iowa side of the Missouri River, where, west of Council Bluffs, the traveller finds to-day what is known as the Transfer Station, though this is, in matter of fact, some distance south of Section Ten.

General Grenville M. Dodge, who was chief engineer of the Union Pacific, and in charge of construction during 1866 and thereafter, still survives, a Nestor in the honourable company of American construction engineers, and his name will always be coupled with the work of putting the first railroad across the Rockies. His reminiscences throw a pretty side-light on this decision of Lincoln's concerning the eastern terminus. In 1858 General Dodge—assigning the date from recollection—after a summer of engineering recon-

noissances west of the Missouri, camped with his party at Council Bluffs. Abraham Lincoln at that time was visiting the Bluffs. He heard of General Dodge's return and of his surveys, and sought him out. Sitting with the mountain engineer on the porch of the hotel, Lincoln held him for two hours or more, and drew from him the facts he had obtained and his opinion as to the best route for a railroad across the continent and the possibility of building one.

In 1862, while in command of the District of Corinth, Miss., General Dodge was ordered by Grant to proceed to Washington to report to the President; Lincoln had remembered the talk of 1858 on the hotel porch of Council Bluffs. The question of the eastern terminus for the newly authorised railroad was then a national question. In General Dodge's opinion there was, from an engineering viewpoint, but one natural route for a railroad to cross Iowa, the Missouri River, and the great plains. The route proposed by him was that along which the Union Pacific was afterward built. It offered the advantage of a great open road from Omaha to Salt Lake, 600 miles of it up a single valley—that of the Platte. This, in turn, led to the natural pass over the Rockies, the lowest in all the range, and to the continental divide at a point where it lay in a

basin 500 feet below the general level instead of on a mountain summit. Any engineer, in General Dodge's opinion, who should fail to avail himself of rich possibilities should have his diploma taken from him. Lincoln acted on these views in designating Omaha as the Missouri River terminus.

In its political aspect the extending of Government aid in the building of the first transcontinental railroad must always remain an extraordinary enactment in our national legislation. The Civil War alone made such a step possible. The period had rudely brushed away constitutional and *laissez faire* legislators and reasoning, and the men who stood in Congress for action went in this case to the other extreme. The building of a Pacific Road had every war argument in its favour. Such a line, it was urged, would bind California more closely to the Northern interest, and would enable the United States more promptly to repel any attack on the coast ports. Moreover, it would enable the Government more easily to control Indian outbreaks among those tribes still unreasonable enough to object to being exterminated.

It must not be forgotten, however, that during the gloomy days of the Civil War Indian outbreaks, whether justifiable or not, were serious matters to a Government struggling to maintain itself; and an argument seeming trivial now might

have been serious when people were excited or depressed by every rumour and portent. As a final argument it was urged that the building of the Pacific Road would put an end to the Mormon question, and the completion of it was the real beginning of the end.

The very name used by Congress in creating the corporation, "The Union Pacific Railroad Company," implies a reflection of the Union sentiment of the Civil War period. The use of the word has been ascribed to the "union" of various corporations and plans in the project. But there is undoubtedly more than this to it. By far the most powerful arguments in favour of the road were the war needs of the Government. The word "Union" was everywhere foremost in the thought and speech of that day, and Federal action was meant to come as a final answer to the demand of nearly twenty years for national legislation on the Pacific Road subject; to the foes of the Union it was flung as an evidence of confidence and strength on the part of the Republican Party and its Union administration. But of the burdens carried during those days by Abraham Lincoln there is no more pathetic glimpse than this, that in the midst of the profound anxieties of his struggle to preserve the nation he was required by Congress to determine the detail of the proper

track-gauge for the Pacific Railroad. Nor will it surprise any one conversant with the legislative spirit of the war period that, after President Lincoln had long and painstakingly considered the subject and decided on a track-gauge of five feet, Congress cheerfully and at once passed a law changing the gauge to four feet eight and one-half inches.

The act of 1862 was supplemented by a second act in 1864 containing more liberal subsidy provisions, and under this charter the Union and Central Pacific Railroads were built. The coterie of capitalists who undertook the enterprise believed that their major profits would come from the construction rather than from the railroad as an investment, and in order to insure these to themselves they acquired the charter of the Pennsylvania Fiscal Agency, a name afterward changed by the Legislature of Pennsylvania at the instance of George Francis Train to "The Credit Mobilier of America," and the Credit Mobilier not only constructed the Union Pacific but made for itself and for a number of American statesmen the most sensational record of a long and exciting day of plots and counter-plots in Pacific Railroad history. For the beginning of construction much work had already been done. General Dodge had crossed the Missouri River as

early as 1853 in the interest of projected Iowa railroads which sought to ascertain where a Pacific Road would be likely to fix a Missouri River terminus. Until the Civil War General Dodge was busy with reconnoissances and surveys. When he entered the service, Peter A. Dey took it up, and in 1862 put regular parties in the field on the first range of the Rockies, and over the Wasatch range under a son of Brigham Young. These surveys extended from the Missouri River to the California State line and included twenty-five thousand miles of reconnoissances and over fifteen thousand miles of instrumental surveys. They were made almost entirely under army protection, but despite all precautions many men were scalped by Indians. Ground for construction was broken at Omaha with a florid speech by George Francis Train, December 2, 1863, and actual construction began on the Union Pacific very early in 1864. Leland Stanford, on January 8, 1863, had turned the first shovelful of earth for the California end of the undertaking at Sacramento. In nine months the Omaha enthusiasts had completed the first eleven miles of one end of the transcontinental line. The Californians had come to a standstill with thirty-one miles. Thus the race started slowly; but at its close there were days when Jack

Casement laid six and seven miles of Union Pacific track between sun and sun.

The route the new road followed from the Missouri River had long been famous on the frontier. Spaniards had probably reached what is now Nebraska as early as 1541, but it was more than a hundred years later when Indians on the Mississippi described to Father Marquette the course of the Missouri, and his map showing the Platte flowing into the Missouri is still preserved. White men in 1739 had explored the Platte as far as the present village of North Platte in Nebraska, and French traders made a highway of the river for more than a hundred years afterward. The expeditions of Lewis and Clarke, close upon the Louisiana purchase, opened the country to American influence, and St. Louis became the great outfitting point for the adventurers and traders who penetrated to the remote regions of the Northwest. In 1812 young Robert Stuart, bound overland from the mouth of the Columbia River with despatches for John Jacob Astor, found himself unhorsed among mountain wastes in what is now Wyoming. The little party, groping, half-famished, toward the head waters of the Missouri, stumbled on the north fork of the Platte River, followed it through the Black Hills, wintered under its cottonwoods on the Nebraska bottoms, and

in the spring brought to St. Louis the first definite story of a trip down the line of the future Pacific Railroad. In 1825 trappers of the American Fur Company had made headquarters as far west as the Beaver Valley in Wyoming and Jim Bridger had already tasted of the waters of the Great Salt Lake. In 1820 Jacques Laramie, murdered on the bank of a Wyoming tributary of the Platte, had left his name not alone to that river but to the plains, the mountains, the peak, the county, the city, and the fort that still bear it. Trappers headed by Milton Sublette and Bridger bought Fort Laramie in 1835, and it became the rendezvous of a generation of men that has passed and whose like we can never see again. Frémont was there in 1842, and Parkman, following the Platte trail in 1846, has left the story of his trip up the valley that General Dodge was to follow with his surveyors for the overland route.

In 1832 Captain Bonneville camped under Chimney Rock and, penetrating Wyoming, skirted the Wind River Mountains and fished trout from a tributary of the Green River. He was the first white man to take a wagon across the continental divide on the line of the future railroad. Here the Mormon pioneers began their long journey to their unknown home beyond the mountains, for Frémont's narrative had decided Brigham Young

upon his great undertaking. Along the Platte year after year were strung the wagons of the Forty-niners, and in a calm made sweet by the blossom of the wild plum and a sunset brought near by the thin, clear air of the mountains rose the camp-fires of the patient homeseekers following the overland trail.

But the valley scenes changed when the railroad contracts were let. The grading camp made a rough companion to the quiet outfit of the immigrant. Civilisation, now really coming, advanced in its mask of vice, the characteristic of its rise and its decline. The grader, the gambler, the criminal, and the adventurer moved together across the plains with the tough town, the outlaw, and the vigilance committee. The forks of the Platte were reached by the tracklayers at the close of the second season's building, 1866. But before these first 246 miles were completed some conception of the enormous difficulties of the undertaking had dawned on the promoters.

The Union Pacific was building across a desert with a base at Omaha that was likewise beyond a railroad connection. The engine for the Omaha railroad shops was dragged across country from Des Moines. The Central Pacific, building from the western coast, was compelled to get everything except ties by ship, around the Horn or by way

of Panama. Marine insurance was on a war basis, and the capital of the Californians was eaten into by indemnity tolls. The Union Pacific lacked even the tie supply afforded the Californians by the Sierra Nevadas, and was compelled to skirmish hundreds of miles up and down the Missouri River for ties and bridge timbers. Moreover, the Indians of the plains had already filed their protests against the novel invasion. Before the rails had been laid two hundred miles from the Missouri River, Turkey Leg and his Cheyennes swooped down on Plum Creek, scalped a hand-car pilot, derailed the freight train following, and with the engineman and fireman burning in the wreckage plundered the box-cars and made away heavy with booty.

It happened that General Dodge in his car, a travelling arsenal, was on his way down from the "front" when news of the capture reached Plum Creek Station. On his train were twenty-odd men, in part the crews, some discharged men and some adventurers bound for the rear—all of them strangers to the chief engineer. The reports coming in by telegraph brought every one to the little station platform. General Dodge called on the men about him to fall in and go forward to recapture the freight train. Every man within hearing went into line and by his bearing showed he was a

soldier; and when, reaching the scene, the chief gave the order to deploy as skirmishers these frontiersmen advanced as steadily and in as good order as the veterans that climbed the face of Kenesaw.

In truth every contractor's camp had a military front. Engineering parties were always guarded by detachments of United States troops, and a little station in Wyoming still bears the name of Percy, for Engineer Percy T. Brown, killed by Indians. "Engineers reconnoitred, surveyed, located, and built inside picket lines. Men marched to work at the tap of the drum," says General Dodge. "They stacked their arms on the dump and were ready at a moment's warning to fall in and fight for their territory. General Casement's track-train could arm a thousand men at a word, and from him, as its head, down to its chief spiker such a battalion could be commanded by experienced officers of every rank from general to captain."

Amid these difficulties construction proceeded with such materials as could be brought up from St. Louis and St. Joseph during three months of water transportation; but on November 7, 1867, the last railroad link in the transcontinental line east of the Missouri was completed. William B. Ogden had pushed the Chicago and Northwest-

ern Railway into Council Bluffs, and that road, then, as now, a powerful ally of the Union Pacific, began pouring track material into the Council Bluffs yards, giving the latter road an actual railroad base for its supplies.

It was needed. The Central Pacific party, taking advantage of the law of 1866, which opened the continent to a race between the east and west builders, were bending every effort to get to Salt Lake ahead of their eastern competitor. Each of the two parties at interest was determined to secure to itself the greatest possible mileage because every mile built meant round profits in lands and in bonds. The two companies instead of being co-partners became bitter rivals, and up to the last moment in which a junction of the two roads was effected made every possible effort to overreach one another. During 1867 General Dodge had already pushed the Union Pacific to Cheyenne in Wyoming, which after November 14th became the winter terminus.

The whole country now awoke to the contest that the Union Pacific and the Central Pacific were entering upon. Which should reach Salt Lake first, and which should win the big Government subsidies ranging through the mountains from $64,000 to $96,000 a mile?

The Union Pacific chief engineer after a New

York conference during the winter of 1867–68 returned to Omaha, called his staff around him, and laid out his plans. These centred upon Ogden, Utah, 502 miles west of the end of the track, as the objective point for 1868, and Humboldt Wells, 216 miles west of Ogden, for the spring of 1869. Preliminary lines had been run but no final location had been made west of Laramie City, where town lots were sold in April, 1868. General Dodge had already solved the vital problem of the pass across the Rockies by getting lost one afternoon in the Black Hills, if it is fair so to describe the accident which led to the remarkable discovery. For over two years all explorations had failed to reveal a satisfactory crossing of this secondary range of the Rockies, known as the Black Hills, which on account of its short slope and its great height is the most difficult of all the ranges to get over. On this occasion General Dodge, returning from a Powder River campaign, leaving his troops, with a scout and a few men, rode up Lodge Pole Creek, along the overland trail, and struck south along the crest of the mountains. Indians beset the little party before noon and got between them and their trains. Holding the Indians at bay with their rifles, they retreated. It was nearly night when they finally escaped the enemy, and meantime they had ridden

down an unknown ridge that led out of the hills and clear to the plains without a break. That night General Dodge told his guide that if they saved their scalps he believed they had found the crossing of the Black Hills; over this pass the trains of the Union Pacific run to-day.

This engineering work of running the lines through the Black Hills, then, had, in 1867, already been done; but beyond that point absolutely everything was yet to be done. Engineering parties were distributed during the winter months, to be on the ground when spring opened, and those destined for Utah crossed the Wasatch Mountains on sledges with the snow over the tops of the telegraph poles. The track was laid across the Black Hills, and this gave the opportunity to run ties down the mountain streams instead of bringing them 800 miles from the Missouri River. Even after the builders had reached the Hills the country afforded nothing but the roadbed and ties, and it took forty carloads of material a day to supply "the front." In April, graders were at Laramie, working from daylight till dark, and the construction crews worked every day without an hour's loss of time from the start to the season's finish. Every man, from the chief of construction to the water carriers,

seemed bitted for a finish heat, and that season they actually pushed their grade to Green River, to Ogden, to Salt Lake, and to far Humboldt Wells.

Winter caught the builders at the foot of the Wasatch range, but it no longer stayed them. The spirit of the fight had got beyond that, and the frozen earth was dynamited like rock. Track was laid across the Wasatch on a bed covered with snow and ice, and one of General Casement's track-laying trains slid, track and all, off the ice bodily into the ditch! Even the Mormons roused themselves, and under Brigham Young's exhortation turned mightily into the race. In railroading then, as in politics later, the watch-word was "Claim everything," and the Central Pacific people astonished the eastern builders by filing a map and plans for building as far east as Echo, some distance east of Ogden.

The two companies had 20,000 men at work. The Casement brothers of the Union Pacific construction forces rose to the occasion. Eastern newspapers were carrying daily headlines, "The Union Pacific built —— miles to-day." In the beginning a mile a day was considered good work, but the Casements had long been laying two miles a day, and now were working seven days in the week, and every hour the light gave them, and

they crowned their supreme efforts by laying in one day nearly eight miles of track between daylight and dark.

The Central Pacific meantime stayed not for stake and stopped not for stone. They had fourteen tunnels to build, but they did not wait to finish them. Supplies, even to engines, were hauled over the Sierras, and the work was pushed until, in the spring of 1869 the opposing tracklayers finally met at Promontory, Utah; the moment at which the law had declared a junction must be made had arrived.

On May 10th Leland Stanford, Governor of California and president of the Central Pacific, and Durant, Duff, and Sidney Dillon, of the Union Pacific, assembled with their friends to drive the spike that was to signalise the completion of the great undertaking. A little company of regular soldiers with a garrison band from Fort Douglas preserved the military atmosphere of the long struggle. The Mormons who had helped so faithfully with the roadbed were there, and the coolies from San Francisco and the Irish tracklayers from the Atlantic seaboard faced each other. Strawbridge and Reed, the rival superintendents of construction, placed under the rails the last tie of California laurel. Spikes of silver and of gold from Montana, Idaho, and Nevada

were presented and driven into it, and Dr. Harkness, on behalf of the greatest Pacific State, presented the last spike wrought of California gold.

It is all very pretty to read the florid accounts of this final scene. The country was waiting for the coming moment. Telegraph wires everywhere had been silenced to repeat the final blows of this silver maul which were to ring from the little valley in the Sierras to end and end of the United States. The first engine from the Pacific faced the first from the Atlantic, and amid the silence of uncovered heads the Governor of California and Vice-President Durant, of the Union Pacific, drove the last spike.

No such story is written anywhere on the records of our railroads. The days when Dodge ran the line, Jack Casement laid the rail, Leland Stanford drove the spike, and Bret Harte supplied the poem can never come back. Literature and the railroad had not become wholly divorced when the California poet wrote "What the Engines Said." Public sympathy and the railroad had not yet completely parted company when from the stages of theatres and on the first pages of newspapers particular announcement was made of the celebration to come on the next day. The

rejoicing in San Francisco reached the extravagance of a kermess. In the bay the shipping was bright with bunting, and between gaily decorated buildings processions of jubilant citizens marched all day. What matters it that we know now that the electric current suffered stage fright, and that the ring of the sledge on the last spike could not be made to repeat beyond Omaha? Is it not enough that the chief operator was equal to the occasion and drove the heavy blows in dignified clicks at the telegraph office on the Missouri River? What *is* of consequence is the way in which the clicks were received, the blows repeated at San Francisco on the great bell of the City Hall, and cannon booming with the last stroke off Fort Point, and on Capitol Hill in Omaha a hundred guns following the explosion of bombs and the screaming of steam-whistles.

It was the rejoicing of our crude days. Capitalists, prominent citizens, volunteer firemen, and horseshoers could still walk happily in one tireless procession when the last Pacific Railroad spike was driven. Grant took the news in the White House, Chicago turned out a parade four miles long, New York City was saluting the Pacific Coast with salvoes of artillery, Trinity chimes were ringing "Old Hundred," and Trinity

voices were chanting "Te Deum" when the earliest transcontinental line was finished; and in Philadelphia the old bells were ringing in Independence Hall. For American railroading surely those were the golden days.

THE EARLY DAY IN RAILROADING

THE EARLY DAY IN RAILROADING

NOTHING in early American railroading is really so impressive as the feats that railroad men have accomplished with the scanty means they had to do with. To recall now that an early Kentucky road used rails made of grooved stone and faced with a strap of iron seems like looking back 600 years instead of sixty. Early-day railroad stories, too, often have a humourous turn because the contrasts are so striking. It is difficult to picture an infancy of railroad affairs in which railroad directors elected train conductors; yet an early board of Michigan Southern directors passed resolutions on such matters, balloted for captains of trains, and took the radical step of declaring that no credit be given for railroad passage.

Railroad travel in America goes back even of conductors. Under the earliest plan the train engineer collected the fares and the fireman handled the baggage and freight. Nor was there in the beginning that urbanity between rival railroad managements which is now universal. Railroad accidents, for example, are so delicate a matter

that to refer in an advertisement to the mishaps of another line would to-day be thought monstrous; but in 1837 a Michigan superintendent announced that "Great care is taken in keeping this road in repair, thus avoiding accidents *similar to those occurring on other roads*, daily jeopardising life and limb." When such a handbill made its appearance, can the rage in a rival superintendent's office be imagined? Or can a railroad executive of to-day conceive the gnawing pains under an early-day president's belt when having but two locomotives in the world, he found himself forced to sell one to a hated competitor in order to pay his taxes? Worse than that, because infringing on a dignity that should be the highest—that of a directorate—there was a time in American railroading when, the sheriff having levied on all the furniture, the directors of the Michigan Southern Railroad, meeting in their New York rooms, had to borrow chairs from neighbouring offices to deliberate in.

The fact is that American railroad building in its beginning afforded an opening for the speculative mania that always has sought outlet in one or another form of American industrial activity. When American railroad building first began, every community wanted its road in order to get its share of immediate advancement. In consequence, everybody—preachers, farmers, lawyers,

and doctors—built railroads. Nearly all of the first ventures failed. The initial cost usually swamped the road by the time it was ready to run cars. The few lines which, under exceptional conditions, made money fast inflamed the country with railroad building as it has been inflamed at times by mining crazes and oil crazes or real-estate booms.

In instances these first railroads were given banking powers, and issued wildcat currency, forerunner, perhaps, of watered stocks, which were an afterthought. Industrial conditions were at the outset so crude that railroads which in 1837 paid thirty per cent. dividends went into bankruptcy in 1840. The idea of putting a part of the earnings into a surplus or reserve fund had not then been thought of. A few carefully managed and conservative lines succeeded from the start. Most of these were built, as the Pennsylvania, on the wrecks of earlier ventures, but a remarkable exception was a little Cleveland road, begun with many misgivings in 1850. It opened for business in November, 1852, and in July, 1853, paid its first semi-annual dividend of five per cent. This was not unusual. What is unusual is that this road never thereafter failed to pay regular dividends. It made its stockholders rich, and a small block of its shares, taken reluctantly by the city of Cleveland, was the basis

of the Cleveland municipal sinking fund that has since become world-famous. A more extraordinary municipal railroad experience, however, has been that of Cincinnati. Cincinnati enjoys a peculiar distinction in that it has been the only American municipality, possibly the only one in the world, that has ever built a railroad—and in this instance a very big and successful railroad.

In 1836 the project of a railroad from Cincinnati to the South was agitated. The usual speeches, illuminations, and conferences, however, resulted in nothing. The Ohio River traffic had made Cincinnati. At one time this traffic extended to the Western frontier, and the steamboat trade with St. Louis, Memphis, Vicksburg, and New Orleans was of first importance. When the railroads came this was cut off. Three lines of railroad from the Atlantic seaboard had put New York, Philadelphia, and Boston in touch with the West, and the old route through Pittsburg and down the Ohio River to Cincinnati had been almost abandoned. To the South the situation was even more serious. In 1859 the Louisville and Nashville, completed to Nashville, had, with its connections, cut off from Cincinnati every Southern city. Meantime the Civil War opened. General Burnside, during his East Tennessee campaign, had written President Lincoln, it is said,

urging the building of a railroad from Cincinnati to Knoxville as a line of communication; but Lincoln, with his great common-sense, realised that such a step transcended the proportions of Burnside's campaign, and, in answering, diplomatically confined himself to the observation that it was quite proper for a general in the field to make any expenditures required by military necessity. Accordingly, Burnside went ahead with some valuable and thorough surveys—and ended with them.

But these military surveys, though coming to nothing for the campaign, were to bear good fruit long afterward. Cincinnati realised that the question of a railroad to the South was a question of her very existence as a city. The laws of Ohio, based on early and disastrous experiences, forbade the issuing of bonds or the granting of aid to a railroad on the part of any municipality, county, or of the State itself. Pennsylvania and Michigan had already suffered severely in railroad ventures. At this deadlock matters stood when a young Cincinnati lawyer, E. A. Furgeson, concluded that although the perplexed city could not aid a railroad she could build one herself. He made public the novel proposition, and it won attention. After a protracted struggle the Legislature of Ohio passed the enabling bill, and, though peculiarly

drawn, the act has stood the test of thirty-five years of continual litigation.

Louisville rose in arms when the project assumed definite shape. The Legislature of Kentucky passed a bill endeavouring to kill the road by taxation, but Cincinnati overcame all obstacles, the road was built to Chattanooga and leased shortly afterward to the Cincinnati, New Orleans and Texas Pacific Railway. The most interesting feature of this unique undertaking is that the road was well built. The numerous and thorough surveys made first by the military and afterward by the city were followed by careful construction. During the last decade American railroad systems have been relocating and rebuilding large portions of their lines, but no such work has been found necessary on this admirably built road. Its bridge across the Kentucky River was the first cantilever built in America, and was, when erected, the highest span in the New World. The Ohio River bridge, with a channel span of 515 feet, was said when built to be the longest truss span in existence. Lavoinne, the French engineer, in his work on American railways, describes the Kentucky River structure as the most remarkable viaduct in America, both in proportions and plan of construction. Cincinnati put $18,000,000 into her venture, but she has never lost one dollar of her

rentals. Her income to-day exceeds $1,000,000 a year, and the scale increases from year to year. She paid 7.3 per cent. interest on the bonds issued for the construction of the road, and there were times when she had to turn out her street lamps on moonlight nights to pay her interest; but her reward is now coming, not alone in her traffic supremacy, but on her actual investment. The story of the struggle for and against the undertaking, extending over a generation, reads like romance, but the railroad was needed, and its building was good business, even though hazardous in the extreme.

There were, on the other hand, many railroads undertaken where they never could be made to pay; but failure was no deterrent to the American people. They blundered on, learning all the time, and in an early moment, when despair had overtaken the whole country as to its railroad undertakings, some monetary genius suggested the bond and mortgage as a means of providing money to build railroads, and modern railroad building was accomplished. By this expedient the initial cost of construction was funded, the railroad found a chance to breathe while getting a traffic foothold, and in spite of many abuses in which the money of investors has been filched in these securities, the plan has opened, next to Government securities,

the greatest investment field in modern finance. It alone has made possible our national railway development as it exists to-day.

The tremendous efforts made by towns and counties and States to secure these early lines of transportation are quite forgotten. They were on a par with all pioneer hardships, and, considered now, are often pathetic. Ten years after Michigan roads had begun advertising that emigrants for Indiana, Illinois, and Wisconsin Territory could save two days by taking their route, Illinois women, in order to encourage railroad building, were selling their butter, eggs, chickens, and cheese to pay for railroad stock that they had subscribed for—depriving themselves of the scant luxuries of pioneer women, and often using means they had put aside for the education of their children to get railroads. Communities bonded themselves to give aid to railroads until they found their generous impulses had bankrupted them. Another side of the picture is even more painful. In repeated instances dishonest promoters secured the bonds thus voted and never built the roads for which they had been given. With their money stolen, such communities refused to pay their bonds, and litigation over them filled the courts. Among many others, the city of Watertown, Wisconsin, defrauded in this way, repudiated its railroad bonds, and

fought judgments against the municipality for a generation.

To avoid the United States Court processes that would have compelled the levying of taxes, Watertown ran its local affairs for years without a visible mayor, council, or any municipal official on whom a court paper could legally be served, and local humourists still show the dam across the Rock River under which the mayor and council were said to have met for many years in clandestine sessions. Wisconsin farmers, to secure railroads, gave notes for their stock subscriptions, and secured them by mortgages on their farms. Needless to say, the roads failed, and the farmers lost their farms through their efforts to secure transportation facilities. It is small wonder that a legacy of distrust and hatred is still in some communities a portion against all railroads.

In physical obstacles the river was the great stumbling-block of the early railroad. Terminals were often fixed at the Mississippi and the Missouri rivers because of the enormous expense involved in crossing such streams. Ferries served in these cases to fill the industrial gaps, and, in some instances, pontoon bridges, a famous one being that of John Lawler, at Prairie du Chien, on the Mississippi. Here was a case in which corporate enterprise waited on individual initiative.

John Lawler at that point began transferring freight and passengers across the river by steamboat to connecting railroads. He then conceived the idea of a pontoon bridge that should carry trains across the Mississippi intact, and so arranged, of course, as to provide a draw for river traffic. With this venture he succeeded so well that the railroad companies renewed his contract on favourable terms, and he put in a pile bridge with float draws. The boat interests of the rivers were then so much more powerful than the railroads that it was often difficult to get permission to bridge a navigable stream. The first railroad bridge to cross the Mississippi was built at Rock Island, Illinois, in 1856. William C. Brown, in a recent address before an association of Illinois manufacturers, presented a curious story of the history of this first industrial highway across the most fertile valley in the world. No sooner was the bridge completed, at an enormous expense, and after the most herculean pioneer railroad effort, than St. Louis steamboat interests demanded its removal as a nuisance and an obstruction to navigation; and in a bill filed by James Ward, a citizen of St. Louis, in the United States District Court for the district of Iowa, he prayed that it be so adjudged, and that it be "abated and removed, and said river be restored

to its original capacity for all purposes of navigation."

On the third day of April, 1860, this court adjudged that this first railroad bridge crossing the Mississippi River was a "material obstruction and a nuisance," and ordered the defendant "to abate and remove all the said piers, together with the superstructure thereon," within six months. Judge Love, presiding, stated very carefully in his decree the reasons for his decision. "If one road transport freight and passengers to the east and west without the delay and expense of changing at the river, a financial necessity will compel competing roads to provide themselves with the same facilities." From this, Judge Love, who died recently in Iowa, foresaw that if this obstruction were allowed to stand there would be railroad bridges across the Mississippi every forty or fifty miles, thus interfering with river traffic so as to do great and serious mischief.

But Abraham Lincoln, who, fortunately, was counsel for the bridge company, could not see it in that way, and he appealed to the Supreme Court of the United States. Lincoln, with that tremendous grasp of things as they are that marks the difference between the big man and ordinary men, conceded that the bridge was an obstruction but held it to be not an unreasonable

one. He argued that rivers and railroads were both great highways for the people, and that travellers by the one were entitled to as much consideration as travellers by the other. He even ventured the prediction that the time would come when the number of passengers crossing the river by railroad would equal and perhaps exceed those travelling up and down the river in boats. Meantime, repeated attempts were made to burn the bridge, and two employees of the Chamber of Commerce of St. Louis were arrested and tried for conspiracy to destroy the bridge by fire. A decision at Washington finally reversed the Circuit Court: the bridge stood; but even in the Supreme Court it won by a narrow margin. Three distinguished justices dissented from the majority and put themselves on record with an opinion that would, had it prevailed till now, make it unlawful to put a railroad bridge across the Mississippi River.

The obstacles of the law were frequently invoked to stop the progress of the railroads across rivers, and in cases where permission was grudgingly given to build drawbridges, it was provided that these must stand open at all times save when a train was crossing. The structural problems of big railroad bridges were solved when General William Sooy Smith built the first steel railroad

bridge in the world for the Chicago and Alton road across the Missouri River at Glasgow, Missouri, in 1879. To-day these huge steel bridges are everywhere across American inland waterways, and good bridges of ten years ago are being taken down every day to be replaced by structures heavy enough to take care of bigger engines than were dreamed of at that time.

Consolidation of railroad lines was fought fifty years ago quite as vigorously as it is now, and of necessity quite as ineffectively. When Vanderbilt was knitting together the strands of the New York Central system, passengers by rail were required to make four changes of cars, transfer their baggage each time, and buy tickets over the four separate roads that covered the distance of 197 miles between Albany and Buffalo. When it was proposed to consolidate these four little railroads a furious opposition arose, and it required three years of continuous effort to bring about the result. From Buffalo to Cleveland two changes of cars were made in those days—one at Dunkirk and one at Erie—and when it was decided to change the track-gauge of the roads meeting at Erie, so that passengers might ride from Buffalo to Cleveland through Erie without changing cars, a local war ensued that has never anywhere in our community histories been paral-

leled. The facts are so little known as to justify details.

On the morning of December 7, 1853, a violent ringing of the court-house bell roused the people of Erie from their beds, and the men of the town hurried, village fashion, to the point of alarm. Speech-making was under way before a dozen villagers had gathered. Alert citizens had called together their fellow-townsmen to make a final defence of their local rights against an outrage threatened by the railroads. It had for some time been known that the two railroads purposed changing the track-gauge to run trains through the town, and great indignation had been felt among Erie people. As the crowd grew the excitement heightened, and the streets became packed with men ordinarily peaceful but now inflamed by harangues from the court-house steps into a fury. An attempt at organising the crowd for action resulted in a sort of disorderly procession, the mayor being called upon to head it, and the mob started for the railroad bridge at State Street.

It was the beginning of actual hostilities in the afterward famous Erie war. Few even well-informed men have ever heard of this early-day railroad fight. If a question concerning the occurrence were raised, most men of to-day would

try vaguely to connect the phrase with shadowy recollections of the Gould-Fisk struggle to control the Erie Railroad. But the Erie war, so-called, has no connection with the railroad known as the Erie: it takes title from the pretty Pennsylvania town where it occurred half a century ago. At that time when what may be termed the pioneer railroad merger was attempted at Erie, Pennsylvania, it resulted in an uprising and a subsequent local feeling so intense that even yet in Erie the echoes have scarcely died. Indeed, it may be doubted whether any American community has ever sustained a feud so violent and lasting. To-day, it is true, the matter may safely be spoken of, but so serious has its aspect always been considered that in the community where it occurred never until September 6, 1903, had an account of the affair been printed in a newspaper; and I only follow Mr. John Miller, the painstaking local historian of the feud, in saying that this Erie war resulted in more acute bitterness, in deeper animosities between former friends, more painful differences in families, and more lasting injuries to local interests and to society than any community, North or South, can show as the result of the Civil War.

Naturally, the only question that now arouses interest is, What was it all about? And the an-

swer only increases the mystification. Two railroads at that time ran into Erie, one from the east with a track-gauge of six feet, and one from the west with a track-gauge of four feet ten inches. The two roads were distinct in ownership and management; each had its own rolling-stock and locomotives, and each its little roundhouse; these two roundhouses may still be seen standing in the city of Erie. The difference in track-gauge made it impossible to transfer freight in carloads from one road to the other, and passengers from Buffalo for Cleveland were compelled to leave the cars at Erie, ride across the town in 'busses, or walk a mile to the other railroad station, and endure the attendant inconveniences. 'Bus men, baggage transfer men and local hotel men, having common interests, worked together, and, if connections could be made to fail, a night at an Erie hotel was a part of the long journey from Buffalo to Cleveland.

This annoyance was what some railroad Jim Hill of that day conceived a plan for doing away with. His plan was radical, revolutionary even, and so expensive as to make it difficult to carry out, but he carried it. Owning the stock of one road, he set about acquiring the stock of the other, and announced that the six-feet-track-gauge was to be changed to conform to the four-

feet-ten gauge, in order that trains might be run from one road over the other, and passengers carried from Cleveland to Buffalo and through Erie without change of cars!

The townspeople of Erie flew to arms. Erie was to be trodden on, ignored, made a way station, its hotel business ruined and its 'busses put out of business. One intelligent citizen, described as a prominent man in the town and a public educator, urged that the transfer of passengers at Erie meant a great gain to Erie because travellers had to get their meals there; the transfer of live-stock, he argued, involved the expenditure of money for feeding; the reloading of freight gave employment to a large force of freight handlers—and on arguments such as these men were urged to arms. The gathering on the December morning in 1853 was the climax of all the talk. Goaded by frantic appeals, the men of the town followed their mayor in a noisy mob to the long wooden railroad bridge. It was guarded by a force of railroad employees because the agitation had for some time promised trouble. A shower of rotten eggs and missiles soon dispersed the guard. The mob attacked the bridge, and with shouts and cheers tore it timber from timber, and when the destruction was complete set guards over the ruins and marched victorious back to town. From that time until Feb-

ruary 1, 1854, when the railroad succeeded in getting a train through, Erie was in the hands of a mob.

Few of the men that wreaked so summary a vengeance on the railroad bridge had a clear idea as to what their grievance actually was. They knew only that they were "for Erie." While the Erie bridge was being wrecked, a second mob at Harbor Creek tore up the railroad track where it crossed the Buffalo highway. Trains were stopped there under compulsion; a guard was maintained night and day, and the railroad company was not allowed to repair the damage done. For a long time the management was compelled to transfer its freight and passengers to Erie by wagon.

These overt acts, as the lawyers love to call them, keyed little Erie up to a true war spirit. Men moved about with grave faces, and the whole community perforce took sides in the fight. The great majority stood with the rioters, or Rippers, so-called, and the few railroad sympathisers were contemptuously dubbed Shanghais. Every effort made by the railroad company to accomplish its design was watched. The townspeople slept on their arms, and to call the defenders together the court-house bell rang wildly at the the most unseasonable hours. Rumours flew far and wide. One bitter winter morning the alarm

was sounded that a railroad employee at Harbor Creek had driven a pick through a Ripper's skull. Forthwith the men of Erie took to their bobsleighs and cutters, and with their muskets raced madly to Harbor Creek. The rumour proved false; an altercation had taken place, a pistol had been drawn, and a man wounded, but there had been no murder. Occasionally the ludicrous contrasted with the serious. Emboldened by their success in destroying railroad property, the Harbor Creek Rippers decided one day to capture a train. They charged the cars and took possession, but the engineer opened his throttle and headed with speed for New York State. The frightened Rippers one by one dropped off the hind end until only one—"Bill" Cooper—remained. The trainmen seized "Bill," now badly frightened, and carrying him well into New York State, stopped the train, threw him off, and kicked him all the way back into Pennsylvania, where for many years he exhibited his wounds to sympathising friends.

Meantime, the militia had been called out by the mayor to preserve the peace. The general of the militia chanced to be a leading Ripper named Kilpatrick. He responded eagerly to the call, and with two cannon and a boisterous force of sympathisers he went duly into camp to preserve

the peace—from his viewpoint. A large number of special constables were also called into service, their duties being to see that the railroad companies made no repairs and moved no cars. The company appealed to the courts, but the sheriff was powerless to perform his duties, and his deputies were rotten-egged. A United States marshal arrived from Pittsburg to serve an injunction on the rioters, who were interfering with the mails. The Ripper leader stamped the process under his heel, and the marshal was glad to get away with a whole skin. A local editor at Erie, publishing a paper named the *Constitution*, was also attorney for the railroad. He was attacked in his newspaper office and embroiled with his friends in a bloody fight. In 1856, following another outbreak, the office of the *Constitution* was gutted one night by the Rippers, the books were burned in the street, and the building was razed. The mob then visited the editor and the railroad attorneys at their homes, and bombarded the houses with stones; but, as the houses of railroad sympathisers had long been in a state of siege, the shutters were up, and no harm was done beyond the slight uneasiness such an experience might awaken in a sensitive editor's breast. A war of pamphlets began, and one curious old Ripper, a Major Fitch, developed a wonderful

talent for rhyming, and his poetry became one of the features that kept the fight alive.

This period of hostilities lasted for three years. An alarm from the court-house bell, rung with the wildness of a panic, could be looked for at any moment, day or night. Wherever the alarm caught an Erie citizen, or whatever his occupation, he dropped his tools, his knife and fork, or his cup of coffee, and rushed to the court-house. Weddings were stopped, funerals delayed, and doctors left their patients when the court-house bell rang. Frequently men were roused from their beds to assemble at the court-house where rumour had reached the watchers that the railroad was plotting mischief. In 1855, the railroad company having restored the old wooden bridge torn down two years earlier, the Rippers again marshalled a mob. The railroad guards were driven from their posts, the bridge was torn down, and this time, to make the job complete, it was burned. The tension in the town all this time and for years thereafter was such that the railroad war could not safely be discussed. It was a cannon cracker that might be depended on to explode wherever handled among friends.

The most peaceable citizens fell to blows over the railroad question, and special constables were appointed in the town to enforce an order forbid-

ding, under pains and penalties, the discussion of the subject. The townswomen became infected with the rancour. The leading dry-goods merchant of Erie, who was trying only to sell his wares and keep out of trouble, became an object of suspicion, and certain other merchants were classed with him as railroad sympathisers. A meeting of the townswomen was called at a Presbyterian church, and it was largely attended. The merchants designated as Shanghais were banned by name, and a vote to refuse to trade with them was carried with enthusiasm. Here was boycotting in an early day. The ministers found it impossible to keep clear of the fray, and the Erie historian records instances of how the Erie war coloured the sermons and cropped out in the prayers. From the pulpit pointed allusions were made to the oppressor, to the rich and to the powerful, who were selling their birthrights and oppressing the poor. A faction of the members of one church in consequence of these insinuations withdrew in a body, and founded a church which still stands in Erie, and was known for many years as the Shanghai church. In politics the Rippers were supreme, and they elected legislators and sheriffs year after year. The courts, however, finally disposed of the matters at issue. Concessions were made to Erie interests, but the track-

gauge was changed, the final compromise being at the present standard of four feet eight and one-half inches, and the consolidated roads, which now constitute a part of the Lake Shore and Michigan Southern, succeeded in running trains through Erie without transferring passengers by 'bus.

The fight for industrial progress has thus been a singularly fierce one, even among so progressive a people as our own. On the question of consolidations intelligent people differ quite as strongly as they did in the days of the Erie war; but consolidations are likely to go successfully on, as they went then, just as long as the industrial situation calls for them.

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